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ABSTRACT

This document comprises a program schedule; welcoming remarks by Herman Liebaers (Brussels), entitled "Towards a European Equivalent of the Council on Library Resources"; and conference papers presented at an international conference on cooperation among research libraries. The following papers presented at the conference are (with two exceptions) included here: (1) "Cooperation in the PICA Library Network" (Look Costers, The Hague); (2) "Shared Cataloging Networks in the Federal Republic of Germany: Some Problems of Planning and Realization" (Guenter Gattermann/no formal paper prepared); (3) "Library Automation in Sweden: Central vs. Local" (Lars-Erik Sanner, Stockholm University Library); (4) "The Linked Systems Project: Its Implications for Resource Sharing" (Henriette Avram, Library of Congress); (5) "The Consortium of University Research Libraries: A New Cooperative Venture in the U.K." (F. W. Ratcliffe, Cambridge University); (6) "Setting Up a Network of 'Responsibility Libraries' in Sweden" (Kari Marklund, University of Lund); (7) "Resource Sharing among Research Libraries: How It Ought to Work" (Richard M. Dougherty, University of Michigan); (8) "North American Efforts at Worldwide Acquisitions since 1945" (Edward G. Holley, University of North Carolina); (9) "International Cooperation in Preservation" (John Jolliffe, Bodleian Library); (10) "International Cooperation in Preservation of Library Materials" (William J. Welsh, Library of Congress); (11) "Research Libraries Group Preservation Activities" (Marcus McCorison/no formal paper prepared); (12) "The Electronic Library" (Patricia Battin, Columbia University); and (13) "Co-Operative Networks and Service to the Scholar" (Brenda Moon, Edinburgh University). (THC)

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International Conference on Research Library Cooperation

October 1 - 3, 1984

Stanford, California

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PROGRAM SCHEDULE

Conference Session I (Monday, October 1; 13:30-17:00)

Welcome

- Remarks by Richard W. McCoy, Rutherford D. Rogers and Herman Liebaers

Automated Bibliographic Systems: Problems, Prospects and Linkages

Chair: Susan K. Martin

Discussant: Joseph A. Rosenthal

- Look Costers, "Cooperation in the PICA Library Network" (#1)

NO FORMAL PAPER PREPARED

- Guenter Gattermann, "Shared Cataloging Networks in the Federal Republic of Germany: Some Problems of Planning and Realization"

- Lars-Erik Sanner, "Library Automation in Sweden: Central vs. Local" (#3)

- Henriette Avram, "The Linked Systems Project: Its Implications for Resource Sharing" (#4)

Conference Session II (Tuesday, October 2; 09:00-12:00)

Consortia and Cooperative Programs: National Possibilities and International Limitations

Chair: Rutherford D. Rogers

Discussant: Alexander Wilson

- F. W. Ratcliffe, "The Consortium of University Research Libraries: A New Cooperative Venture in the U. K." (#5)

- Kari Marklund, "Setting Up a Network of 'Responsibility Libraries' in Sweden" (#6)

- Richard M. Dougherty, "Resource Sharing among Research Libraries: How it Ought to Work" (#7)

- Edward G. Holley, "North American Efforts at Worldwide Acquisitions Since 1945" (#8)

THE RESEARCH LIBRARIES GROUP, INC.
INTERNATIONAL CONFERENCE ON RESEARCH LIBRARY COOPERATION

Conference Session I
October 1, 1984

Welcoming Remarks

by
Herman Liebaers
Europalia
Brussels

TOWARDS A EUROPEAN EQUIVALENT OF THE COUNCIL ON LIBRARY RESOURCES

International Conference on Research Library Cooperation
Stanford, 1-3 October 1984

1. Though national governments should still improve their support of research libraries, the scholarly community feels the need to pull resources together at the European level. Large libraries in the U.S. are larger and richer than their European counterparts and they already have accepted the idea that no one institution can meet the needs of its patrons. Economic pressure and new technology both favour cooperation.
The economic considerations which prompted first nuclear research at a supra-national level in Europe are now valid for most research fields.
The needed infrastructure which libraries and information services provide are generally accepted as of basic importance to any advanced project ~~as well~~ both in the humanities as and in science and technology.
As to the new technology it is obvious that it is the same in Europe as in the U.S. The applications are however much less advanced in Europe than in the U.S. The explanation of this situation is, it seems to me, the core of what I want to convey to you. It has several components and I shall come to it in a moment.
The growing integration of libraries into the whole field of scholarly communication, which goes from university management to electronic publishing, is being recognized in and outsite the traditional library field. It is important that other patterns of collection building, of bibliographic access, of availability of publications and of transborder data flow receive priority from a European angle. Library management, preservation and human resources are other problems to which the research libraries have to address themselves.

./..

A European consciousness is developing in different fields, as well at the governmental as at the non-governmental level. Within the scholarly community it has been accepted that eminence can nolonger be achieved within national boundaries. Consortia in the field of research libraries are however much less developed in Europe than in the U.S.
The C.L.R. being the recognized leader in enhancing the services of research libraries, I have been exploring the possibility of setting up a European equivalent in order to improve the efficiency of European research library. I shall conclude this feasibility study by the end of the year, but I already can give you the general trend of these conclusions knowing however that the present conference will have, at least so I hope, an impact on these conclusions.

2. All of us know that private foundations do not have the same significance in Europe as in the U.S. Notwithstanding I have been trying to look for a European "Library committee" as the one with which C.L.R. works and which is the principal means to channel foundations money to C.L.R. It would be an overstatement to say that I have been moderately successful. With two exceptions and I shall come back to them, foundations in Europe have national interests. You would translate national by local. National boundaries in Europe are still eminently strong and it is impossible to ignore their strength, though most national professional organizations have come to the conclusion that self-sufficiency is nolonger a realistic aim. To the profession it is clear in Europe that the information revolution ignores national boundaries, and efficient answers to the challenge of this revolution have to be dealt with at a transnational level, it being understood that national components will remain pre-eminent.

Private foundations, whether they are interested in libraries or not, have not yet completely realized this rather new situation.
The 25 major foundations in Europe have an informal semi-annual meeting of their directors, the so-called The Hague Club. This Club refuses for the time being to go beyond this informal exchange of ideas and to launch joint projects. So I have written individually to each member explaining the purpose of a European cooperation among research libraries. The answers are rather on the negative side. It is sad that in countries where library development lags behind, the foundations are the least interested. Let me be frank : the countries of Southern Europe. It happened so that The Hague Club had a meeting in my home town, Brussels, last May and that I was able to talk, always individually, to a number of members. As a result of these contacts I would say that a minority is interested in the project.
Often the interest is expressed in the following way : though we work within our national boundaries, we would be willing to consider a European project provided it comes to us through a national channel.
Fortunately I can add to this rather dim report that two foundations, with an outspoken European avocation, the European Cultural Foundation, with headquarters in Amsterdam, and the European Science Foundation, with headquarters in Strasburg, have taken a strong interest in the cooperation among research libraries in Europe.
Some of you may wonder why I have not yet spoken about LIBER, the European League of Research Libraries. I shall keep that for the end.

3. However the balance is extremely positive of cooperation at the governmental level. So the picture is exactly the contrary of what it is in U.S. All three organisations - the European Economic Community,

the Research Division of Nato, and the Council of Europe have not only shown strong interest, but are contributing financially to the current feasibility study and have indicated willingness to go beyond this initial seed money.

I did not yet find time to talk to OECD people in Paris.

E.E.C. has organized a meeting of experts in Brussels on 29-30 March of this year on the impact of new technology on research libraries. The minutes of this meeting are available. (1) With your permission I would not go now into the conclusions, good ones I would say, of this meeting, but I shall come back to it at the appropriate session, where I hope to collect American reactions on top of the one I already have from Lee Jones.

NATO Research Division is financing, together with E.E.C. and the Council of Europe a meeting of decision-makers organized by the E.C.F. in Luxemburg on the forthcoming 19-23 November. Its program is similar to our present meeting here.

There are two main differences : more Americans here, more Europeans there. Though not surprizing, I would urge as many of you as possible to go to Luxemburg in order to carry the weight of this meeting over to the old continent in the most efficient way. The second difference is much more important : here we are working in one language, in Luxemburg four languages will be used : English, French, German and Italian. It seems essential to me to mention the language problem in Europe in connection with this meeting. Too many Americans still assume that everybody understands them in Europe. That is not true and it may suffice to draw the attention to the uneven representation among the Europeans who are here.

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(1) Technical Committee Meeting of Experts, Brussels, 29-30 March 1984 (c/o P. Goossens, Royal Library, Brussels).

The lack of knowledge of English in the Southern part of Europe is obvious and is reflected in the quantity of representatives. I am not referring to the quality. It is not my intention to expand here on the language problem in Europe, because I am sure it will turn up again at the meeting which I shall be chairing Tuesday afternoon : "National Responsibilities and International Solutions". However I think that the discrepancy between the North and the South of Europe cannot be reduced to a language problem. It is deeper and has probably a religious background : catholic in the South, reformed in the North. It seems to me that this difference commands other differences, which make cooperation with Southern Europe much more difficult from an American angle. If we want to have one or more sequels to this meeting it certainly is a problem into which we have to look more carefully.

Before concluding I would like to avoid ~~to~~ being accused of looking at the cooperation among research libraries in Europe from a too personal point of view. C.L.R. saddled me smoothly on my present venture, with the argument that it had contributed in a major way to international library cooperation and that it was about time that we in Europe should put up our own scheme of cooperation with the necessary funding. I accepted the challenge, but fortunately I was not alone. From what I have said up till now you can conclude that in all organizations mentioned I found responsible people convinced that the venture was worth trying.
I shall only mention Mr. Raymond Appleyard, D.G. XIII Information Market and Innovation at E.E.C., Mr. Henry Durand, Director of the Research Division on Nato and Mr. Raymond Georis, Secretary General of the European Cultural Foundation.

Independently of this endeavour it is however my pleasure to mention :

1. the achievements of E.E.C. in such directions as
   - Euronet / Diane ;
   - Docdel, illustrated by the Artemis project for electronic document delivery ; Apollo project, a joint project of the E.E.C. and E.S.A. for satellite transfer of documents ;
   - Automatic translation.

   It is a common feeling that the future cooperation will expand in this direction.
2. At the international level organizations like IFLA and FID, have contributed fundamentally to the improvement of the situation in Europe and to the dialogue between the U.S. and Europe. It seems to me that IFLA has been most instrumental in this direction, mainly through program funding by C.L.R. Actually there is quite some overlapping between the new core programs of IFLA, as defined originally by the Standing Conference of Directors of National Libraries and the topics delt with by the E.E.C. meeting I mentioned earlier and to which we shall come back tomorrow.

I guess I have to say a word here about developing countries. You know that I have been rather deeply involved in international professional work and it is common knowledge that I have opened IFLA to the developing countries. This being said, I would like to exclude radically the problem of the developing countries from the present dialogue between U.S. and Europe. The know-how we are trying to share and where Europe is at the receiving end should be at the disposal of the developing countries through Unesco. For a NGO like IFLA it is too expensive to work with developing countries. That is the sole responsibility of Unesco. Though I have always been critial of Unesco, I should urge the U.S. not to leave the Organization. But Unesco should understand what a sound policy of transfer for professional skills means. I hope that U.S. pressure will bring more reasons and wisdom into the Organization.

3. Quite a number of transnational projects are operational, and I am afraid I am not aware of all of them. Nordinfo is one, the international guide to MARC Data-bases and Data Services issued by the International MARC project (IMP) with the support of the Deutsche Forschungsgemeinschaft is another one. I am sure that the European libraries here present will be in a position to quote more examples. I would like to draw particularly your attention to ELAG - European Library Automation Group - formerly called Intermarc, where experts in library and information sciences met. They came mainly from national libraries. They tried to fill gaps, more particularly in the field of adapting in various languages the Anglo- Saxon MARC-format. Currently they concentrate on technical problems related to library automation.
4. Finaly I kept for the end a recent resolution of the European Parliament, setting up a European Library. I quote from the resolution :

> " Calls for the creation of a 'European Library' ;
>
> Does not intend this to be designed on the lines of the national libraries in the Member States.
>
> To provide an indexing service to show enquirers where they can find relevant literature and documentation.
>
> To compile a complete information package to meet an enquirer's roquirements and supply this in the most economical manner."

I had no time to look more carefully into this new development, but there is no doubt that it may prove to become the major tool of a transatlantic dialogue. I am sure that we shall come back to it in Luxemburg next November.

I have been longer than I intended to be, but I do not apologize, because, after all you have invited me here as "the voice of Europe". For my last minute I shall come back to LIBER.
Some twenty years ago a Swiss proposal was made at IFLA to create a privileged link among European research libraries. The initiators of the project feeling that these libraries were squeezed between the extreme poles of the U.S. and the developing countries. Though the U.S.S.R. and the countries of Eastern Europe are active within IFLA, they have a separate organization among their libraries, which, as far as I know, is not limited to research libraries. From the very beginning LIBER established an outstanding working relation with the Council of Europe and hopes were high that LIBER would become the organization the Swiss colleagues had in mind. Facts did not match hopes and the European librarians who accepted to become officers have to blame themselves. I am not going to pass a post quem jugement on LIBER; on the contrary, I think that circumstances are ripe for a new vigorous start of what I would like to call LIBER II. I would suggest that at the end of our present meeting we see if I am right or wrong.
Thank you.

Brussels, 3 August 1984. Herman LIEBAERS.

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Paper No. 1

THE RESEARCH LIBRARIES GROUP, INC.
INTERNATIONAL CONFERENCE ON RESEARCH LIBRARY COOPERATION

Conference Session I
October 1, 1984

"Cooperation in the PICA Library Network"

by
Look Costers
PICA Bureau
The Hague

The Pica Library Network

In 1969 a number of Dutch University Libraries together with the Royal Library decided to cooperate in the area of computerized so called Library Information Systems.
After a study period it was decided in 1977 to make a practical start and develop an online shared cataloguing system using mini computer hardware, based on the philosophy that "a publication in the Netherlands will be catalogued only once and this only in so far the title is not available from a national bibliography".
In the beginning of 1979 the first version of the Pica Shared Cataloguing System became operational.
In april 1981 a second version was launched which, although a large number of improvements have been implemented since, is still operational at this moment.
In addition to the shared cataloguing system a Union catalogue- and Interlibrary loan-system was develloped and implemented in May last year and is fully operational as of september 1983.
Together with the shared acquisition-system on which this paper will not focus, these systems comprise the central facilities of what is called the Pica Library Network.

Shared cataloguing system

The central database of the shared cataloguing system is fed offline with national bibliographic tapes from the Library of Congress and the British National Bibliography.
All participating libraries and the Dutch national bibliography are using titles found in the database and entering new ones if a title is not found. Added to all titles is information of general interest as well as information of local library importance. The information is stored on different levels:

- general bibliographic level, containing bibliographic title information which can be shared by all libraries. However a distinction has been made between data, only important to public libraries and data only important to research libraries. These two kinds of libraries have their own 'window' on the bibliographic data.
- local bibliographic level, containing all data that are only of interest to one specific library and which are only accessible for the library concerned. This information is valid for all copies of a publication. An example of data on this level is a systematic classification according to a system designed by an individual library, a common practice among Dutch research libraries.
- copy level, which is pertinent to the specific copies

and can consist of information such as shelf-number, selection-key for offline output, etc.

Within the general bibliographic level hierarchies of records may be build for instance in case of serial publications and in case of article-descriptions belonging to periodicals, by using record interlinking.

These "families of bibliographic records" can be inspected and searched by using a so called family-presentation screen.

In addition to the three levels of information the system uses, for the purpose of quality control, information stored in authority files. In the Pica shared cataloguing system authority files may exist on both the general bibliographic level which means that this authority file is a shared authority file available to all participants, and the local bibliographic level which means that this authority file is only available for one participant to whoms local database the authority file is linked.

In the Pica shared cataloguing system the authority file on authors as well as the authority file on corporate names are shared authority files.

On the local level there are several keyword authority files and also authority files on bookprinters, geographical names etc.

As far as formats is concerned Pica is using an internal format for information storage which is a compilation of the LC-, BNB-, Intermarc- and Unimarc-formats and an external format called PICA-II-format which is used for online input and presentation purposes. An online conversion-module which is executed for each transaction makes the conversion from internal to external format and vice versa.

Because of this it is possible for libraries using the same title-information in the same title-database to work in different external formats for instance PICA-II format and BNB-marc-format by using two different online conversion modules; one for PICA-II and one for BNB-marc.

Apart from the standard online functions for searching, input, updating, inspection, etc. for bibliographic data on all three levels, a current addition is the facility for automatic online authority-filing which greatly eases the work in maintaining authority files and linking bibliographic records to them.

The central database of Pica's shared cataloguing system now contains more than 2.300.000 title-descriptions to which over 1.600.000 holdings have been added.

In addition authority files contain a large number of authority records.

The general authority file on author names contains over 300.000 records.

Union catalogue- and Interlibrary loansystem

In the Netherlands there are officially three union catalogues, in fact there are four:

- union catalogue for technical sciences
- union catalogue for agriculture
- union catalogue for humanities, social sciences and medicine and the union catalogue for periodicals (these two are maintained by one organisation).

The online union catalogue system, as developed by Pica, will eventually cover all material included in these union catalogues but at the moment, as of May 1983, only serial publications are included in the Pica system.
The main function of the system is that it serves as a facility for interlibrary loan. As 65% of all interlibrary loan-requests are for periodicals, the database of the national union catalogue was primarily stored with descriptions from the union catalogue for periodicals, which were already machine-readable. Serial titles from the other union catalogues were added to these.
The Union Catalogues database now contains about 200.000 title-descriptions and associated holding information on material available in over 300 libraries in the Netherlands.
In the national union catalogue the complete title, the key title, the corporate body and the congress name are indexed according to the keyword-in-context method.
In a so-called primary search one can use the standard Boolean operators 'AND', 'OR', and 'NOT' and other retrieval facilities such as right-hand truncation and/or masking. For periodicals the author name is not important, so that the facility to search on author in a primary search has not been implemented at this moment.
An interesting feature is the secondary search, which makes it possible to search further in the set of titles, selected in the primary search. This is done by typing a special command for secondary search. Two possibilities exist:
free-text-searching on the complete title description and searching on the exact contents of certain elements of a title such as place of publication, publisher, year, author, etc.
Afterwards the selected title or set of titles can be displayed on screen and/or printed. One title is displayed entirely, a set is displayed in a short presentation, one title to each line.
It is possible to ask for a complete presentation of one title from a set. There is a separate presentation of the holding information of a selected title.

Interlibrary Loan.

As stated the online union catalogue was primarily developed to facilitate interlibrary loan. For this purpose a fully parametrized distribution algorithm was established as follows:

- type of library. Several types of libraries can be distinguished depending on the number of ILL-requests they can handle and their traditional function.
  Accordingly the central catalogue departments establish the maximum amount of ILL-requests to be handled by a library each day.
- the circuit a library belongs to. The most projected circuit is the public library circuit: custom is that a public library puts its ILL-request pre-dominantly to another library in the public library circuit.
- the region where a library is situated. This is important when a user wants to bring back a book to avoid postage.

The system will each day on the basis of these parameters automatically make a distribution of the requests entered that day and route them to the selected libraries.
Consequently all libraries of the same type within the same circuit, in the same region handle more or less the same percentage of ILL-requests each day, relative to the individual maximum amount they can handle.
ILL-requests can be inspected and printed online, or printed offline on the printer of the central computer system and sent by post to a library.
An ILL-request to a library must be answered either positively or negatively. This answer is given to the system either online or by sending a preprinted message to an intermediary library, where the answer is entered into the system.
When an answer to an ILL-request is negative, another library receives the ILL-request. Which library is next is again determined by the distribution algorithm.
If all libraries to which a request can be sent give a negative reply or if a certain predetermined amount of time has elapsed the user is informed with a message to that effect.

Participating institutions.

Started by six University libraries and the Royal library the Pica Library Network now is a library network of national importance.
Apart from the University libraries and the Royal Library a significant number of Public Libraries participate, the Dutch library schools are going to participate and a large number

of special libraries are involved in the Pica Library Network. Not all of these are participating in all of Pica's central activities but with over 50.000 books catalogued on a monthly basis it is estimated that more than 70% of all cataloguing taking place in dutch libraries, is covered. This activity is generated by the 30 libraries in the Pica library network which are so called "full"-participants. Moreover in the area of interlibrary loan it is estimated that for serials about 40 % of all interlibrary loan requests are now routed through the system.
As the other 60% for the largest part is directly fullfilled by a number of specialized centres the percentage handled by the system will probably grow only to about 60%.
Online participants in Pica's interlibrary loan facilities now add up to a total of 76 libraries.

Table 1. Activities of Participants.

University libraries

This group of in total nine participating libraries comprises six of the seven member libraries which founded Pica in 1969. The libraries in this group all participate in the shared cataloguing system as well as in the union-catalogue- and interlibrary loan system. In addition there are four university libraries only participating in interlibrary loan.
As far as cataloguing of books is concerned the university libraries account for about 45% of total cataloguing activities. On a monthly basis, total cataloguing activity amounts to some 50.000 books, serials and periodicals being catalogued by the participating libraries using the system.
In the area of interlibrary loan they generate about 36% of total monthly interlibrary loan requests and fulfil about 60% of total requests.
Apart from the cataloguing of bookmaterial the university libraries participate in- and often took the initiative in projects aimed at the cataloguing of other material than books and book-related publications.
Two projects can be mentioned in particular.

The University of Nijmegen took the initiative together with a number of other libraries to start a project for the cataloguing of audiovisual material with the objective to publish a printed Union Catalogue. Titles are limited to film, videotape, microfiche and microfilm and are specifically related to dutch educational institutions. At the beginning of 1984 the first experimental printed catalogue was produced and published containing some 1200 titles.
In 1984 an estimated number of 3000 AVM-titles will

be catalogued.

A number of university libraries among which the University of Amsterdam and Leiden University Library together with the Royal Library started a project on the cataloguing of 19th and 20th century letter-collections.
Up till this moment these letter-collections consist of over two million letters in total.
The existing access-facilities for research are rather crude and no complete picture on this unique source of information is available.
In the beginning of 1984 funds have been allocated and a start was made to catalogue both collections and individual letters and build an online catalogue with sophisticated retrieval facilities for online searching. The project consists of a number of phases and is expected to be completed by the end of 1987.

The Royal Library and associated institutions

The Royal Library in itself is a research library with a significant collection in the area of the humanities.
In addition the Royal Library is the national library of the Netherlands and therefore has responsibility for a number of institutions and projects which are of great importance to the dutch library-community.
All computer applications related to these are carried out by the Pica organization so that a special relation with the Royal Library exists.
The following institutions and projects should be mentioned.

The Dutch National Bibliography is cataloguing about 25.000 titles yearly on monographs, serials and periodicals, both in the area of white and grey literature, using the Pica shared cataloguing system. Each week the current titles are published in the "Boekblad"-magazine which is published by the Dutch publishers and booksellers organizations.
Also a monthly, quarterly commulative and yearly bibliography is printed.
All this is being done by using automatic phototype-setting facilities so that no manual activities are involved.
Because the Dutch National Bibliography is an integral part of Pica's title database and because titles are catalogued at their earliest availability (for part of the publications cataloguing in publication -CIP- is being applied) the participating institutions profit greatly.
The use of one central database for both the production of library catalogues and the National Bibliography presented some problems however which should be mentioned. Initially the bureau of the National Bibliography had the requirement that they would have responsibility for the quality of all

titles in the bibliography. This meant that no other institutions should be allowed to change any title which was part of the National Bibliography. This requirement was difficult to fulfil without upsetting the other participating institutions. The practical solution is that as the bureau of the National Bibliography normally is the first institution to catalogue a dutch title they claim ownership immediately. With this they assume bibliographic responsibility and effectively prevent the title from being updated.

Although it is a theoretical possibility that other institutions are first in cataloguing dutch titles and that they on their turn claim ownership, thereby blocking titles effectively for updating by the National Bibliography, this happens sporadically.

The result is that the National Bibliography has every reason to be the first in cataloguing dutch publications, from which other institutions profit and that a satisfactory solution has been created.

An other problem is the problem of the prefered catalogue-entries especially as far as authornames are concerned.

Most Dutch libraries require, mainly for historical reasons, that the catalogue entry on authornames is via the most complete name form.

The National Bibliography however requires the most well-known name form because of international standardization reasons.

As the discussions with regard to this problem have not led to a communis opinio a technical solution has been adopted. In the authority file on authornames each prefered term may contain a most complete- as well as a most well-known form, the latter being created by the National Bibliography.

On output a switch may be set which determines whether the one type entry or the other type are generated. Although this solution is a bit complicated this is a small price to pay for the advantages of having the National Bibliography as an integral part of the central database of the Pica Library Network.

Another important institution for which the Royal Library is responsible is the Union Catalogue on Maps which has been implemented on the Pica network during the second and third quarter of this year. At this moment the Pica database contains some 30.000 map-titles.

The last project which will be mentioned here is the short title catalogue netherlands-STCN-project. In this project for which a small bureau has been put together all printed books produced in the Netherlands before the year 1800 will be catalogued using displayterminals equiped with specially designed charactersets.

It is estimated that in total about 300.000 books will be processed of which about 10.000 now have been catalogued using the Pica network. The total project is estimated to be finished in the year 2000. The first fase, covering the collection of the Royal Library, which amounts to some 30.000 titles, will be finished in 1987.

Public libraries

A third important category of libraries is the category of public libraries.
In the Netherlands the situation is such that there are about thirteen large public- or city-libraries each located in cities with more than 100.000 inhabitants. These libraries do there own cataloguing and normally have also a significant collection of research- and study-material. They also play an important role in interlibrary loan.
In addition there is a strong centralized dutch public library organization in which all public libraries participate including the thirteen mentioned libraries.
The central organisation runs a service-centre which among others contains a central cataloguing department which does the cataloguing for almost all public libraries with the exception of the thirteen libraries mentioned above.
At this moment the central organisation of public libraries as well as ten of the large public libraries are participating in the Pica Library Network.

Library schools

A fourth group of participating institutions is going to be the library schools which intent to participate in the library network starting at the beginning of 1985.
With one of the six library schools which exist in the Netherlands a pilot project has just been succesfully finished which was sponsored by the ministry of education.
In order to make it possible for students to get hands-on experience with shared cataloguing, interlibrary loan, online catalogue facilities and retrieval systems, facilities have been developed so that special database copies are made available for this purpose. Because an educational master database remains unchanged the teachers have the opportunity to include special cases into the master database so that each year or each semestre a fresh copy of the master database can be used by the students.
The advantage is that the energy which is put into the master database in a shared effort by the teachers of the six library schools is preserved, that the teachers are familiar with the contents of the master database and that written material can be prepared in accordance with the master database.

Others

Finally a number of libraries participate, some of them in all central activities others only in interlibrary loan activities, which are not really a group but which are nevertheless all participants in the Pica Library Network. Among the libraries in this category are libraries as the library of the Peace Palace, the Library of the Central Bureau for Statistics and many others. Especially in this category of libraries are many libraries which only participate in the interlibrary loan system. These last libraries have a relatively large number of libraries among them belonging to commercial or semi-commercial organisations.

Future

Although at this moment the Pica network basically is a hierarchical terminal network, it is the intention to grow towards a distributed computer network in which not only a central computer system and remote terminals are incorporated but also local library computer systems.
In such a network computers of different manufacturers would have to be connected together. As a first step Pica is now implementing the X-25 package switching protocol for communication but it is clear that for the higher levels of the ISO standards much additional work has to be done.
As communication within networks will be undoubtedly followed by communication between networks, it would be especially valuable if some form of international cooperation could be established in this area.

As far as facilities are concerned it is important to note that the Pica Board of Directors has decided that in addition to the central facilities as presented in this paper, Pica will develop facilities which will make it possible to make collections of information available to users on the basis of information retrieval techniques.
It is the intention of Pica to establish itself as a so called host-organisation specialized in non-commercial databases for research- and public-library users.

In the near future decisions will be taken in order to change Pica's existing governance-structure so that not only the Universities and the Royal Library will be on Pica's board but that others also will participate at this level of responsibility.
Pica's legal structure will be transformed into a non

profit cooperation under dutch law, so that with the growing importance within the dutch community Pica's Legal-and organisational- form is clearcut and in accordance with the requirements of a broad spectrum of the institutions involved.

Finally I would like to inform you that Pica at this moment is replacing its central computer systems, which consist of two Digital Equipment PDP 11/70 computer systems and a PDP 11/44 computer system, by a TANDEM NON STOP TXP configuration.

This project with which some ten man-years are involved will be finished by april 1985.

	Shared Cataloguing			Interlibrary loan			
	No. of participating libraries	No. of titles catalogued/month	%	No. of participating libraries	No. of requests issued	%	No. of terminals connected
University libraries	9	25.000	45	13	4.100	36	126
Royal library and institutions	4	14.000	25	3	3.000	26	50
Large Public Libraries and Central Organization	11	15.000	27	11	600	5	46
Library Schools	1	200	-	--	--	-	4
Others	6	2.000	3	49	3.800	33	13(40)
Total	31	56.000	100	76	11.500	100	239(40)*

Table 1. Activities of participants (summer 1984)

*) 239 terminals via leased lines, 40 terminals via dial-up lines.

	In the Netherlands	Full Pica participants (including cataloguing)
University libraries	13	9
Royal library and institutions	6	4 (1)
Large Public Libraries and Central Organization	15	11 (2)
Library schools	6	1 (5)
Others *)	± 30	6
Total	± 70	31 (8)

Table 2. Libraries in the Netherlands

* Libraries smaller then ± 2000 new titles per year are not included.

Paper No. 3

THE RESEARCH LIBRARIES GROUP, INC.
INTERNATIONAL CONFERENCE ON RESEARCH LIBRARY COOPERATION

Conference Session I
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"Library Automation in Sweden: Central vs. Local"

by
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LIBRARY AUTOMATION IN SWEDEN - CENTRAL VERSUS LOCAL

by Lars-Erik Sanner

There are two predominant computerized library systems in Sweden, the LIBRIS system for the state financed research libraries, and the BUMS system for the municipal public libraries. The two systems have some similarities and quite a few dissimilarities. Both maintain a common data base with the records, in basically MARC format,of the participating libraries' literature. The data bases of the two systems have, however, been created in different ways. In the BUMS case, the data base is a result of a retrospective and current bibliographic description of the holdings of the participating libraries, performed by the data base owner, Bibliotekstjänst AB, as the various libraries have announced their intention of participating. The LIBRIS system has been from the very beginning a true, cooperative system, where the data base is the result of a close cooperation in the field of cataloguing. That means that LIBRIS builds on a once-in-the-country cataloguing principle, sometimes extended to a once-in-the-world cataloguing principle, in that a participating library,when accessing the data base for a book already acquired and catalogued by another Swedish library only needs to add its local library information to the existing record. Such a 'secondary' cataloguing can also be done with one of the catalogue records from the Library of Congress or the British Library Bibliographic Service Division which are regularely fed into the data base. The principal purpose of the LIBRIS system is to aid the cataloguing function of the participating libraries and to act as a national union catalogue in the research library area,i.e. as a tool for the interlibrarylending. It is further used for producing the Swedish national bibliography and for providing the libraries with catalogue cards, lists of newly acquired literature and the like.

The main purpose of the BUMS system on the other hand, is to rationalize and speed up the circulation control. Of course, it also forms a union catalogue for the municipal libraries concerned and it also performs a lot of administrative routines in the fairly complicated procedure of providing the public libraries with new material.

The LIBRIS system, which started in the beginning of the seventies, was an on-line system from the beginning, in which the participating libraries could directly update and search the data base via terminal. The BUMS system was originally a batch system, which means that the information and transactions concerning the circulated items were put into and out of the system batchwise. This is still done so, but the data base is nowadays updated on-line and is also searchable by terminal.

I have described these two major systems so thoroughly because they, during the seventies, dominated the library field in its different aspects to such an extent that hardly any other computerization action took place in individual libraries, at least not as far as house-keeping routines and bibliographic control were concerned. The LIBRIS system expanded gradually during the seventies to comprise first two, then fourteen and finally twenty-two libraries. The BUMS system has also gradually increased its number of customers, but it has still a long way to go before it contains a substantial majority of the municipal library organisations.

Before I come to the main topic of my paper, I want to tell a little more about the recent development in the Swedish library automation field, concentrating on what has happened with the LIBRIS system and what has been going on in the research library community. A governmental investigating committee looked into the research library field at the end of the seventies, and decided that, in the first place, the Royal Library should play the role of a national library more actively than before. One of the tasks which were mentioned was the responsibility for the daily operations of the LIBRIS system. Until then the LIBRIS system had been looked upon as a special experimental activity, led by the Swedish Agency for Administrative Development. The investigating committee also proposed that a new official body should be established within the library and information field with the position of a research council and advisory board. This new body, later called the Delegation for scientific and technical information, DFI, was supposed to have the responsibility for the development of the LIBRIS system. The suggestions of the committee were adopted by the government and the parliament in 1978, and as from July 1, 1979, the Royal Library took on its new duties and the DFI started its work.

The task given to DFI of being responsible for the development of the LIBRIS system has been a major concern of the Delegation from the very beginning. To begin with, a working group was appointed with the aim of trying to specify the difference between operation and development. The next step was to try to find out along which lines the development of LIBRIS should go. The choice was fourfold: one could develop the present LIBRIS system further, one could replace the present system with another one specially designed for the purpose, one could buy a foreign turn-key system, or one could connect the Swedish research libraries to an established foreign system such as OCLC. After having studied the matter thoroughly, and after having consulted an English expert, it was decided that the first alternative - a further development of the LIBRIS system - should be chosen. However, in this context and under the influence of the outspoken wish of some of the libraries to establish their own local systems, an attempt was made both by the English expert and by a working group, set down by DFI, to define which functions should be developed within the central system, and which functions should be performed by a local system. The strength of the central system is, of course, the extensive bibliographic data base and the network, which enables a smooth communication between the connected libraries. Consequently, it was stated that the data base should be made searchable also by subject and that the system should be complemented by an inter-library loan function. The importance of the central system as a gateway to other external systems was also stressed. Circulation control and acquisition routines, including periodicals checking systems, were on the other hand considered suitable for local data systems.

It is interesting to see how the circle in this way is again closed. From another starting point we are now back to where we began with the original design of the LIBRIS system based on a central computor with a number of regional computors for the treatment of specific and local information routines.

During the planning phase for the first blue print of the LIBRIS system, far-reaching and penetrating discussions were held about the functions and the content of the central versus the local computor. Many of these discussions have now been renewed and many problems have been discovered, which were not apparent in the first discussions. Some routines - e.g. serials control - seem to be altogether the concern of one individual library. Others, however, seem to be in a sort of mid-area with relevance both for the local system and the central one. That concerns for instance acquisition and circulation control. Much of the information concerning the acquisitions of a library is, of course, local in the real sense of the word, say information about accounting, claiming etc. Other parts of the information could, however, be of interest for the library community as a whole and should consequently be put into the central data base. That is, in the first place, the information that a specific item is ordered for purchase at all, which might affect other libraries' decisions as to the acquisition of the same item. Other libraries may also be interested in knowing the price, the estimated date of delivery and so forth. This has resulted in many libraries requesting rather extensive space and specially tagged fields for acquisition information in the general data format for the central data base, which is under revision due to the adoption of the Anglo-American Cataloguing Rules, second version. On the other hand, many libraries are expecting very much from what can be done by means of a local system, facilitating ordering procedures, claiming, accounting etc. As a matter of fact, at least one Swedish research library has meanwhile accomplished a local acquisition routine based on comparatively simple equipment which supplements the LIBRIS system, reprocessing the information from the central data base for the purpose of ordering and the like.

The local circulation control seems to be, at first sight, a totally local affair. Looking further into the matter, however, it is apparent that - at least in a library community like the Swedish one, where interlending between libraries is much interwoven with the local lending - information and routines, although principally of local character, could be of general interest. It goes without saying that it could be of interest in an interlending system to know whether a requested book is out on local loan or not, before sending an interlibraryloan request. Likewise, it would be advantageous if facilities for mechanical processing of interlibrary loans also could be used for the processing of the local circulation, which will probably take place at the borrowing library. That means for instance, that the bar code chosen for one local system ought to be the same as the one used in other local systems or for interlending purposes. At least, one must demand of a local system that the equipment for reading the bar code, by laser or not, should also be able to read the types of bar codes which might occur in the library system.

What I have said now stresses the importance of a rather farreaching conformity, or at least compatability, between the central system on the one hand and a specific local system on the other. This has also led to an ardent discussion about whether one should permit a wild flora of different local systems, or only accept one version of a local system authorized by the LIBRIS management. There are several, easily discernible arguments for the latter kind of solution. One could manage a better maintenance of both software and hardware if one had only one system to deal with. The interaction between the central system and the local system will be easier with only one system variety to consider. It would be easier for librarians to change jobs if they were already familiar with the local computer system from their previous working place. Perhaps a common solution would also create a better platform for negotiations with presumptive vendors of computer systems.

However, arguments have also been raised in favour of the local 'wild-cats'. The libraries cooperating within the LIBRIS system are so different in size and structure that one and the same system would hardly be suitable for all of them. Competition is often a good thing and could be so also in this case, firstly because it would stimulate the development of better systems, secondly because the competitive situation would mean lower prices. Another reason for different local systems is that many of the LIBRIS libraries are working in the specific EDP environment which is maintained by the library's parent organizations, i.e. in many cases a university. This university may have its own set of computers and may also require the library to use one of these for its house-keeping routines.

All the same, there is no official body in Sweden with the competence to decide which way should be taken, and, considering the independence of Swedish universities and Swedish research libraries, one should not be astonished by the fact that the free choice alternative is the one which has won. This is reflected by the decisions, so far not a great number,which have been taken to purchase local computer systems. At the library of the Swedish University of Agricultural Sciences the Danish RC system has been chosen for different reasons. One is that the university for some years has had a RC computer and that the library had already used the software available for creating a special data base on this computer. Another one is, of course, that the prestanda of the system are considered to be good, and a third perhaps that it would in all likelyhood be easier to influence a system designed in a neigbouring country. The Stockholm University Library has recently decided on but not yet installed a GEAC system. One reason for that choice is that the GEAC system is considered to be a good and well established library system, another one that the quantity of the library stock and daily operations are sufficient to make full use of its own computer. In those cases many other factors may have affected the decisions - e.g. the costs of the investigation, the daily operations, the maintenance and development etc. - but I think that I have pointed at some of the more important considerations.

One more alternative has been developed within the LIBRIS community as a result of two other features of the LIBRIS system - the charges and the communication facilities. LIBRIS users are presently charged with a price per transaction, i.e. any message or order given to the computer with the 'send'-key. Although there is a certain discount effect built into the charging system, the costs increase greatly with an increased use. In this lies an incitement to retrieve information from the central data base and use it outside the central system. That lies also behind the various attempts to establish local systems, but in the case I have in mind - the so called LIBCEPT-project - one is trying to work with a more continous flow of information from the central data base to use on local equipment. The concept of LIBCEPT is that you use a microprocessor which acts as a trap to catch the records from the central data base which are searched from a certain library, for instance for issuing purposes. The microprocessor keeps the record and arranges a special local file which will gradually grow and, after a while, contain the most frequently used literature of the library. Thus, a library user will search for literature via the terminal and in most cases - according to what is known of pertinance of library use - he will find what he is searching for in the local base of high frequency books. If, however, he is looking for something else, the processor leads him automatically further to the central base and, if there is a hit in this base, the record in question will be forwarded to the local base.

This is a beautiful concept which could be developed still more precisely with information from the central base only momentarily conveyed for local use. There are, however, considerable difficulties in realizing the idea due to communication problems. The LIBRIS system is run on an IBM 3033 computer at the state computer service bureau, DAFA. The terminals used - produced in Finland - are asynchrone but by means of a concentrator they communicate with a central dator as bisynchrone terminals over the ordinary IBM 3270 protocol. The concentrator, which can handle up to 16 or 26 terminals depending on size, is a minicomputer which also takes care of the representation of the extensive character set - more than 300 characters including the Cyrillic and Greek alphabets. It is therefore difficult to find out whether a LIBCEPT trap would be put on the net before or after the concentrator and it is difficult to put it anywhere without disturbing the traffic.

It has been decided that the Royal Library, as manager of the LIBRIS system, should define an interface between the LIBRIS system and local systems. The LIBRIS group has also recently defined an output format to enable the libraries to take out their own records for use in local systems. There are still different opinions about how the communication between the central system and the local system should go in the future. For the time being the regular procedure is that the individual library which has put its records in the LIBRIS data base by a LIBRIS terminal, get the records for a certain time period, e.g. one or two weeks, back in the form of a magnetic tape. A smoother way to do it would be to send the records back to the individual library batchwise over the telephone line. Still another solution would be that the local library updates its own local file and afterwards, at suitable intervals, sends records to the LIBRIS system on tape or by line for an updating of the central data base. In the latter case one has to consider the risk for duplicates and for the present time the LIBRIS management seems to estimate the risk as so high that they would not permit this procedure.

LIBRIS has its own multidrop line network, which gives convenient access to the central data base and good communication between the participating libraries. Although it is possible to dial up the system and use it by means of an ordinary teletype terminal, the network as such is not linked to other terminal networks, e.g. the ones built up around the university computers which usually use asynchrone terminals. Therefore, one of the strongest arguments for establishing a local system is that it offers facilities for easy communication with the local network. Thus, we expect at the Stockholm University that the local data base will be available not only to the 60 terminals directly connected to the system, but also to the hundreds of terminals existing at the different departments of the university. As a matter of fact, it will, in that way, be available for terminal users at other Swedish universities as well, as the local university networks are linked together with a special national network, SUNNET.

The development of the BUMS system for the public libraries has been similar to the one of LIBRIS. The main activities are still taking place at the main frame computer of the system manager, Bibliotekstjänst AB, in Lund. One major library, the Malmö Public Library, contributes to the updating of the data base with its own registration by terminal. An increased cooperation within the system is under consideration, with the records of the individual libraries separated in special files like the model used by UTLAS. One big library organization, the Stockholm City Library, has been looking around to find its own local system. A decision has been made to test the LIBIS-DOBIS system on an IBM computer. For other public libraries the BUMS management can envisage a solution similar to the LIBCEPT variety of the LIBRIS environment.

It ought to be apparent from what has been said here that future development in the field of library automation in Sweden is by no means clear. Unlike the United States for instance, Sweden has started with two large central systems, both of which have been more or less forced to cope with the ambitions of local libraries to start their own EDP-projects. To combine the central systems with the local ones and to harmonize the different local projects is necessary for the future. Hopefully, this will be accomplished with success. The technical development with improved possibilities for communication and inter-linking speaks for that. Probably, future development will also be viewed by official bodies in connection with the mission, which has recently been started by the government, of coordinating the computer policy of the Swedish universities. That is another example of the Swedish aptness to centralization, which is sometimes a strength, sometimes a weakness.

Paper No. 4

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"The Linked Systems Project: Its Implications for Resource Sharing"

by
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The Linked Systems Project: It's Implications for Resource Sharing

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Background

In the United States, almost two decades ago, the Library of Congress (LC) MARC Project provided the means for sharing bibliographic data in machine-readable form and the impetus for library networking. Following closely the development of MARC, OCLC implemented its system, proving the viability of a shared online system for library operations. The expansion of OCLC services was rapid, as was the number of institutions involved.

By the mid 1970's, the then Bibliographic Automation of Large Library Operations (BALLOTS) and the Washington Library Network (WLN) were developed which, with OCLC, resulted in three major bibliographic utilities each with its own tailor-made system, database and membership. Although the membership of each utility shared the resources of that utility, there still existed costly duplication of cataloging and conversion since the utilities had no way to share resources among them. The only shared database was the MARC file distributed by LC as part of its MARC Distribution Service.

Although it can easily be demonstrated that a single system would be the most effective way to build a consistent database and avoid duplication of cataloging and conversion, it was obvious that there would not be only one such system in the U.S. The question remained, then, how to work toward the efficiencies of a single network given multiple and disparate systems.

It was in response to this need that senior members of the utilities, networks, and networking-related organizations were invited to LC in late 1975 to explore approaches to the problem. The result was the organization of LC's Network Advisory Committee in 1976, which still exists today and is concerned with various complex issues of networking.

A Committee planning document recommended that LC's Network Development Office serve as an interim network coordinating body.[1] In addition, a task force would be set up to design the interconnection of the bibliographic utilities for the purpose of sharing bibliographic, authority, and location data for any library function requiring such data. The task force, called the Network Technical Architecture Group (NTAG), was funded by the Council on Library Resources and chaired by the LC Network Development Office. It held its first meeting in February 1977 and a basic assumption of the task force design was that each member of a utility would access other utilities via its own utility system.

Early efforts of NTAG included an analysis of the work performed and experience gained from the Research Libraries Group (RLG)[2] link with the LC computer system. RLG at that time used the New York Public Library (NYPL) computer.

In an effort to test the feasibility of not duplicating the storage of LC MARC data, but rather having on demand access to the MARC records housed at LC, RLG and LC established a pilot project linking the NYPL and the LC computer systems via telecommunications. This link was put into operation in 1976 and was probably the first computer to computer link in the library environment, albeit a very simplified version of linking.

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[1] During the same period of time (1975-1976), the National Commission on Libraries and Information Science funded a study for LC to determine its role in the evolving nationwide network. The study proposed that LC assume the role of coordinator for network development and also continue its work on the standards activities required for the exchange of data. Based on the study's recommendations, the Librarian of Congress established the LC Network Development Office.

[2] In 1974, several large research libraries joined together as the Research Libraries Group for purposes of resource sharing and other cooperative activities.

The RLG/LC link permitted access by an RLG member library, via the NYPL computer, to the LC MARC file stored at LC. Staff of an RLG library would search the NYPL database for a bibliographic record. If the record was not in the file, the search query was sent via the computer-to-computer link to LC, invoking the LC searching software. If the record was found in the LC system, it was transmitted via the link to the NYPL system; if the record was not found, a message indicating a negative result was relayed to the system. Even in this early system, the user was searching LC, not by terminal to LC, but by terminal through the users' own system.

NTAG's major contribution was the publication of the Message Delivery System for the National Library and Information Network: General Requirements. This document was a statement of the general technical requirements for a message delivery system, i.e., a communications facility that would link automated bibliographic services on different computers and permit messages to be transmitted over the links, thus permitting the sharing of data and services. NTAG also recognized the need for a message processing system, i.e., the interface between the communications system and the application programs and services which would reside at each host computer system.

In 1976, just preceding this NTAG activity, The National Commission on Libraries and Information Science (NCLIS), with assistance from the National Bureau of Standards (NBS), formed a task force to develop an application level protocol. Such a protocol is required for application programs running on one computer to communicate with the application programs on another computer, regardless of differences in system hardware and software. This NCLIS/NBS work actually was based on the framework for a computer-to-computer communications protocol developed by the Telcommunications Committee of the American Library Association/Information Science and Automation Division and published in the June 1976 issue of the Journal of Library Automation. The Telecommunications Committee decided that a more concentrated effort was required to complete the task at hand. The NCLIS/NBS effort was also built upon other data communications protocols either developed or still under development by national and international standards bodies. It was thus logical that all NTAG plans for a message delivery system were based on the use of the NCLIS/NBS protocol.

In the midst of this activity, staff of CLR, with support from the LC Network Development Office, defined a five-year program which would result in linking the bibliographic utilities and LC. Under the leadership of Warren J. Haas, President of CLR, the program document was used to successfully obtain funding from several major foundations and thus, at long last, the funding was in place to design and implement a computer-to-computer link. WLN, RLG,[3] and LC agreed to link their three systems. The approach was to build a facility that 1) does not require modification of the existing application programs on the different computer systems, 2) is expandable to add new participants without impact on existing members, and 3) is composed of two major components, a) the communications link hospitable to the transmission of any kind of data (bibliographic, authority, location, text), and b) the application processing programs which interface the host application programs with the communications link. These major components relate respectively to the message delivery and message processing systems defined by NTAG.

Linked Systems Project

The total project, known as the Linked Systems Project (LSP), is made up of two elements. The first is the Standard Network Interconnection (SNI), the communications facility. The second is the application programs, e.g., the sharing of authority data and the sharing of bibliographic data. CLR is largely funding the development of the SNI and the first application, that for authorities sharing.

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[3] By this time, RLG had selected BALLOTS as its system and the augmented version of the system has become known as the Research Libraries Information Network.

The NCLIS/NBS protocol had been designed during the earlier stages in the development of communications standards, and, as time passed, some of the strategies changed. Therefore, when LSP funding became available, the NCLIS/NBS techniques had been largely superseded by the International Organization for Standardization (ISO) protocols, which were close enough to completion to be used for the SNI.

The SNI is based on the ISO Open Systems Interconnection (OSI) Reference Model (see Figure 1). OSI was developed by the standards community to overcome the cost and complexity of exchanging messages between systems, different in hardware, software and data representation. Without OSI, two disparate systems would develop a set of special procedures and software to exchange data. If a third system joined the network to exchange data with the other two, additional procedures and software would be required and this would continue for each new system added, creating the growth of tailor-made communications protocols at an exponential rate.

The OSI model is made up of seven layers which consist of all the procedures required for systems to communicate. Needless to say, these procedures must be accepted as standards. Standards for the first four layers exist and work is underway for the remaining three. The concept of layer was adopted to more easily modify a procedure considered faulty without disrupting other portions of the link. Each layer has "hooks" into the next higher and the next lower layers.

In the OSI model a message initiated by a terminal user to an application program passes down through each layer to the lowest layer where the message moves across the communications link to the recipient computer system. Here the message enters the system at the lowest level and passes up through each layer to be processed by the application programs. (See Figure 2). SNI uses all the existing OSI standards and those currently in draft form.

The first application being developed for the LSP is the sharing of authority data. The design of the authority implementation was predicated on an already established system at the Library of Congress, The Name Authority Cooperative Project (NACO) (See Figure 3). NACO permits selected libraries to contribute records for name and series headings to LC for inclusion in the LC authority file. These headings, established by the participating library, are transmitted to LC, amalgamated into LC's file, and distributed via the MARC Distribution Service to all subscribers. When LC catalogs an item and the heading has already been contributed by a NACO participant, the heading is used by LC. Thus LC also stands to gain in the joint building of the authority file.

NACO at present operates using three methods.

1. The contributing library uses LC tools such as the National Union Catalog or Library of Congress Name Headings with References to determine if a heading has already been established by LC. If the heading is not in the LC files, the NACO participant establishes the heading and mails the record to LC for amalgamation into the LC file. The participant is notified by mail as to the final form of the heading. This method is slow and often headings are duplicated because the participant does not have immediate access to LC machine-readable files.

2. The NACO participant has online access to search LC files and thus has up-to-date information as to whether a heading has been established. The procedure then follows (1) above and the heading as established by the participant is mailed to LC. This method is an improvement over (1) but the delays in mailing still may create a situation where LC or another NACO participant will duplicate the heading.

3. Two institutions, namely the University of Chicago and Harvard University, have online access to search LC files as well as to input headings immediately should the record not be available. This method is the best to date but will not be greatly expanded due to possible contention by outside organizations for LC computer resources.

The authority application was chosen as the first for LSP because the most expensive part of cataloging is creating headings and related cross references for the building of consistent catalogs. In addition to the savings connected with the actual sharing of this data, the use of one consistent authority file by many institutions to establish headings for bibliographic records will make more effective over time the sharing of these bibliographic records without requiring local modification in order to add the records to the individual library catalogs.

The authority master file will reside at LC with LSP participants having copies on their systems. LC catalogers will search the LC files. If a record exists it will be used; if not, a new record will be added to the file and distributed via the link to the LSP participants (See Figure 4). WLN and RLG members who are also NACO participants will search their respective files and, if a record exists, it will be used; if not, a new record will be added to the corresponding files. The new record will be contributed to LC via the link for adding to the master file and redistributed to the LSP participants (see Figure 5). Procedures are being implemented for new records as well as updating of already existing records. All records (new and updated) from NACO participants will also be distributed by LC through its MARC Distribution Service.

Record transfer between LC and the LSP participants will take place at least once every 24 hours, thus making the data more timely than the present tape service and avoiding, in most instances, the costly duplication of data. In addition to the record distribution and contribution modules, the other link module under development at the present time is intersystem searching. Intersystem searching will permit the member libraries of one utility to search other utilities for authority records that are in the system and are not part of the LC master file. For example, members that are not NACO participants could enter records into WLN and RLIN and these records would not be contributed to LC and therefore not redistributed to the other LSP participant(s). (See Figures 6 & 7).

In order to implement intersystem searching, an intersystem syntax had to be designed to permit the searching of and display from the LSP participants' systems, all of which are different, through the user's own utility search system.

In summary, we have become "expert" in sharing machine readable data off-line using a common format, we do reasonably well at sharing data with all who can establish terminal-to-computer links with our systems, but the differences in machine hardware, operating systems, and application software have kept separate systems themselves from sharing data. LSP has helped develop tools with which we can break down the barriers to sharing that dissimilar computer systems have created.[4]

Resource Sharing

Let us look at the types of data we are interested in sharing. First there is cataloging data. We are all well aware of the savings that accrue to libraries if the cost of incorporating an item into a collection can be reduced by the expense of cataloging. Carrying out original cataloging on some items can far exceed the cost of the item. Cataloging data is now exchanged on magnetic tape, sometimes taking many weeks to arrive and be loaded on a system. With LSP, it will be possible for a member utility to receive records distributed online, dramatically reducing the time required to make the data widely available. While, initially, LC will offer only authority records online, eventually bibliographic records will be added to the service.

Looking ahead, there is another way in which the standard intersystem links will be useful for sharing bibliographic records. More and more, large libraries or groups of libraries are considering the installation of an automated system, usually to serve as an online catalog or union catalog. These systems are interested in keeping their relationship with their utility and taking records into the local system only when they are used. Thus with the LSP links these different systems will be able to down-load and up-load records as required. We will be out of the era in which dissimilar hardware and software ruled out communication. This will enable institutions and networks to distribute data efficiently among multiple systems.

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[4] In the past year, OCLC has announced its intention to become an LSP participant, implementing the SNI and the authorities application.

The ultimate aim in sharing among libraries is the exchange of library items themselves, not just bibliographic data. Here in the U.S. we have several utilities and other union catalog systems, but access to information on locations and transaction of interlibrary loans is limited to members of each utility. With the appropriate expansion of application programs, LSP links can extend interlibrary loan beyond membership groups. This will be the next major area of standardization that we are interested in seeing developed.

And finally, with appropriate application software, the full texts of books, etc. may eventually be shared over computer-to-computer links. While there are a number of ways this might be done, one scenario would make the data available to libraries and users straight from the publisher's own computer — from the data base that drives the printing of the item. When we get that far into the future, the roles and functions of libraries as they exist today become an interesting topic. We are already seeing full text experiments supplying books, articles, pictures, etc. over terminal-to-computer links so it will not be surprising to see computer-to-computer experimentation in the future.

As indicated above, the next LSP application will be the bibliographic record implementation. The analysis and design for that implementation is already underway.

What is being accomplished has significant implications to the national and international information community. A facility is being established based on national and international standards which will permit the linking of computers within an individual country and across national boundaries. The standards are being tested in an operational environment for all to observe. Hardware manufacturers are also observing the standards activities and already are considering designing chips for some of the OSI layers to replace the current costly software development. Someday, therefore, a new entrant into the network will be able to "buy" the major portion of the OSI standards making it increasingly simpler to share resources.

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"Final report of a study conducted by Lawrence F. Buckland and William L. Basinski."

The Linked Systems Project: Standard Network Interconnection (LSP/SNI) implements a computer-to-computer link following the principles of Open Systems Interconnection.

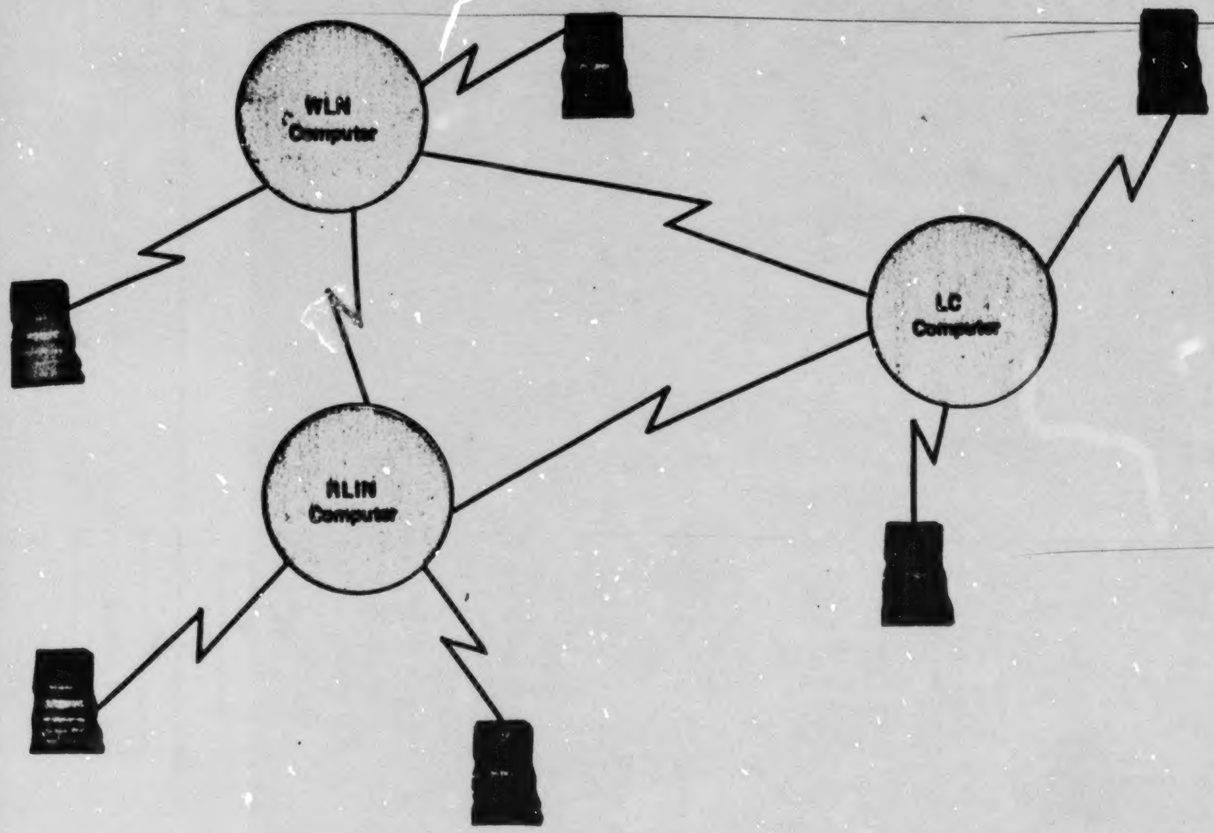

WLN Computer
LC Computer
RLIN Computer

Figure 1

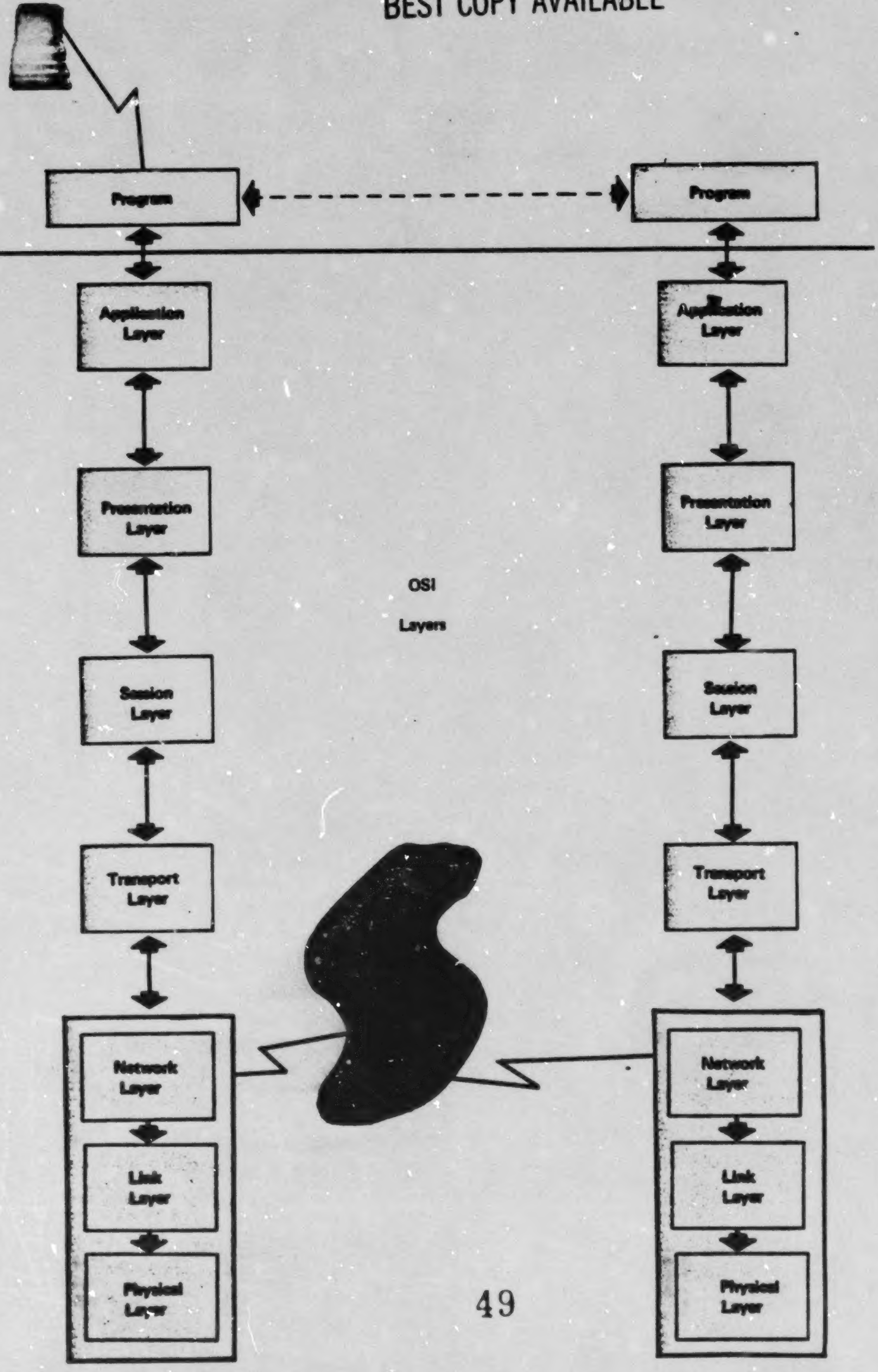

Program
Program
Application Layer
Application Layer
Presentation Layer
Presentation Layer
OSI
Layers
Session Layer
Session Layer
Transport Layer
Transport Layer
Network Layer
Network Layer
Link Layer
Link Layer
Physical Layer
Physical Layer

Figure 2

LIBRARY OF CONGRESS
COOPERATIVE DATA BASE BUILDING SYSTEM
(CODABASE)

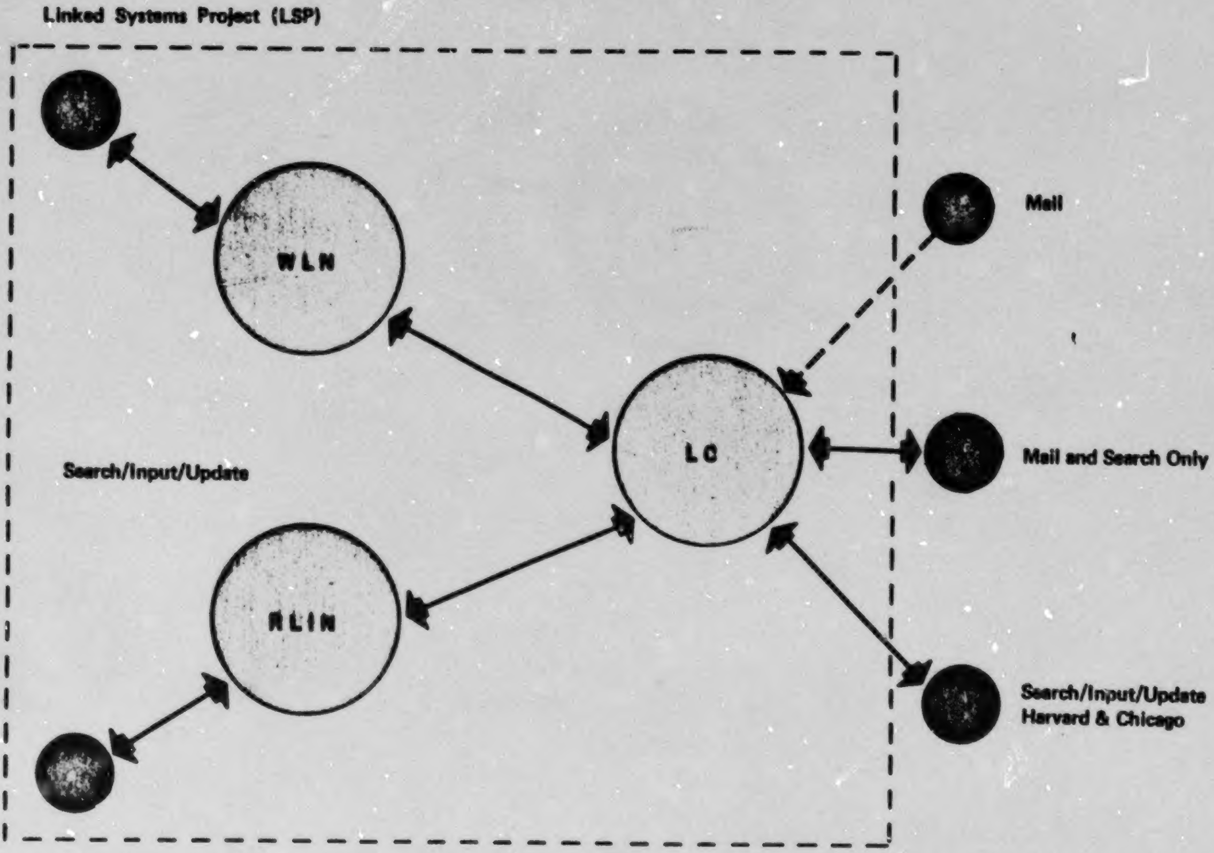
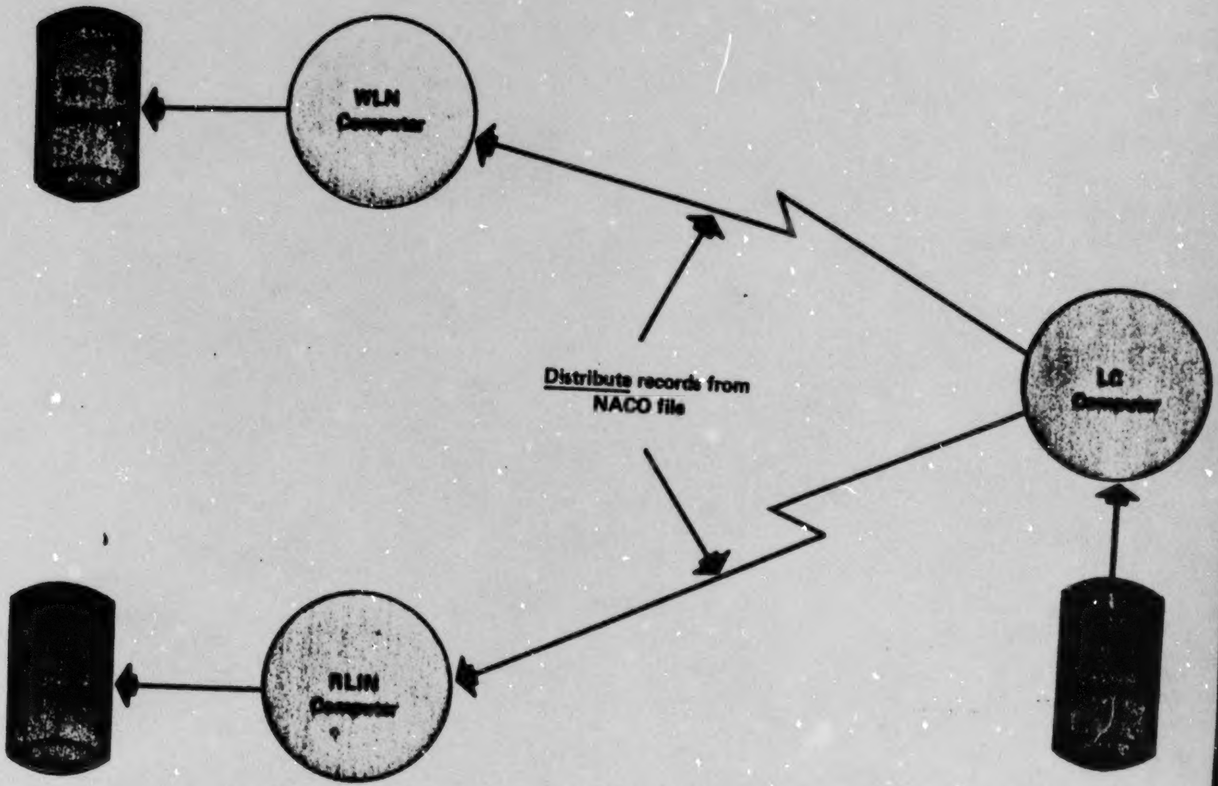

Linked Systems Project (LSP)
WLN
LC
RLIN
Search/Input/Update
Mail
Mail and Search Only
Search/Input/Update
Harvard & Chicago

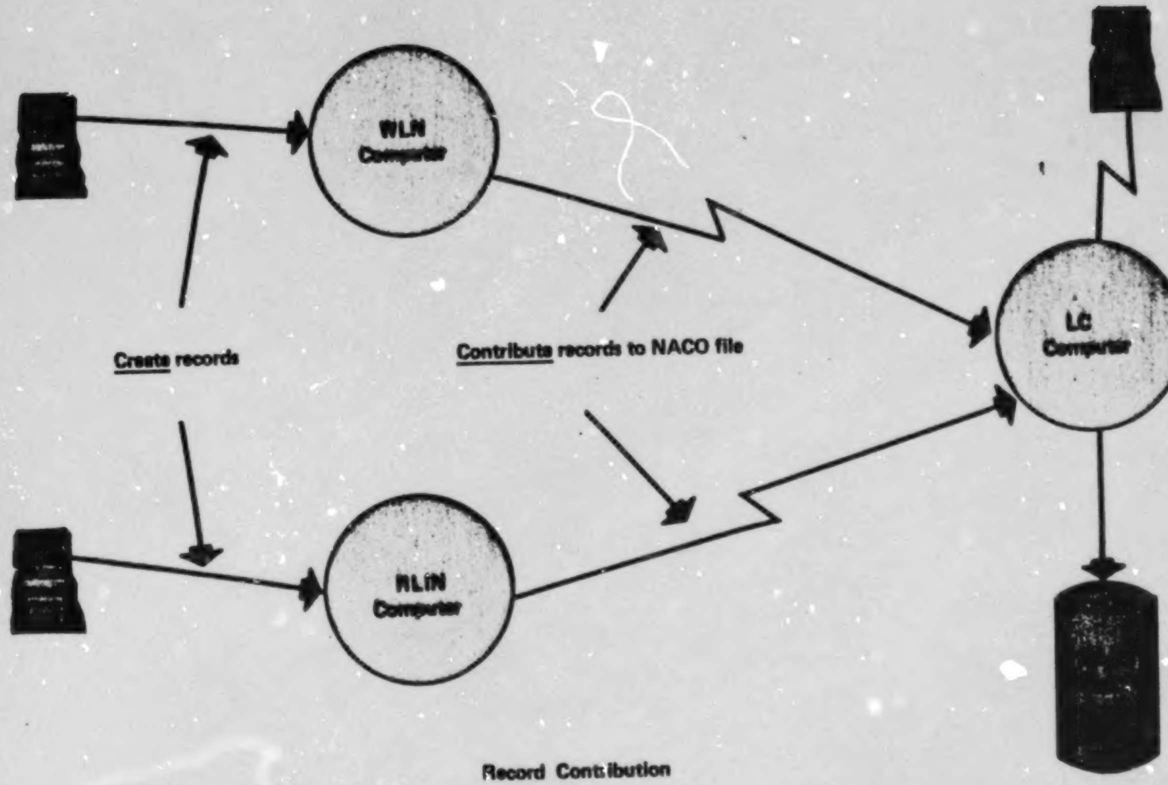
Figure 3


WLN Computer
Distribute records from NACO file
LC Computer
RLIN Computer

Record Distribution

Figure 4

AUTHORITIES IMPLEMENTATION (LSP/AI)


WLN Computer
LC Computer
RLIN Computer
Create records
Contribute records to NACO file

Record Contibution

Figure 5

INTERSYSTEM SEARCHING

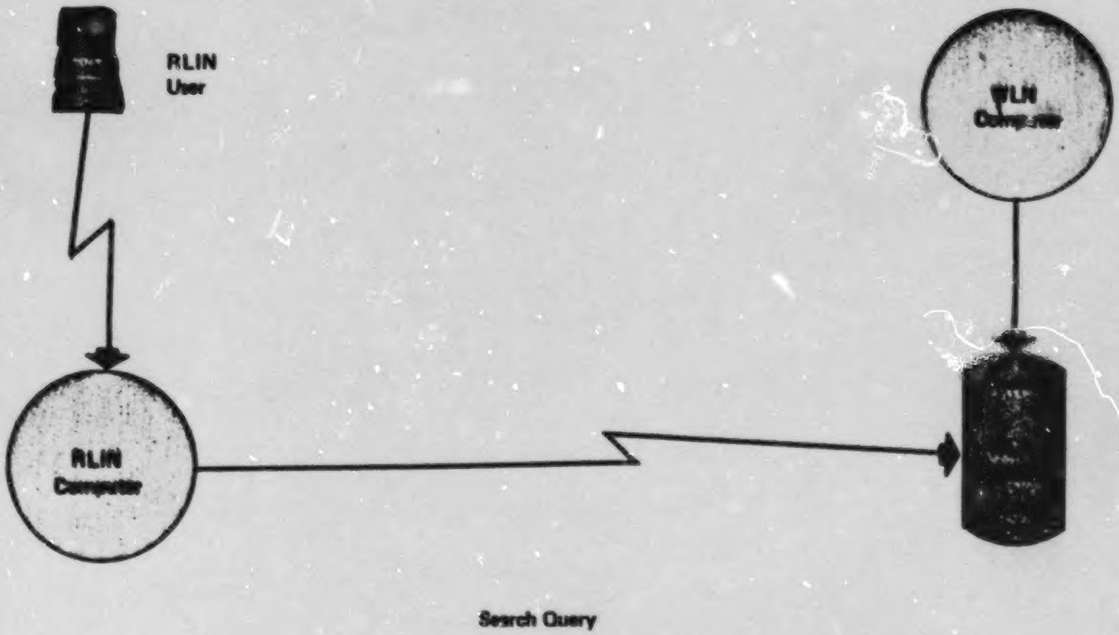

RLIN
User
WLN
Computer
RLIN
Computer
Search Query

Figure 6

. . . . later, after WLN processes search

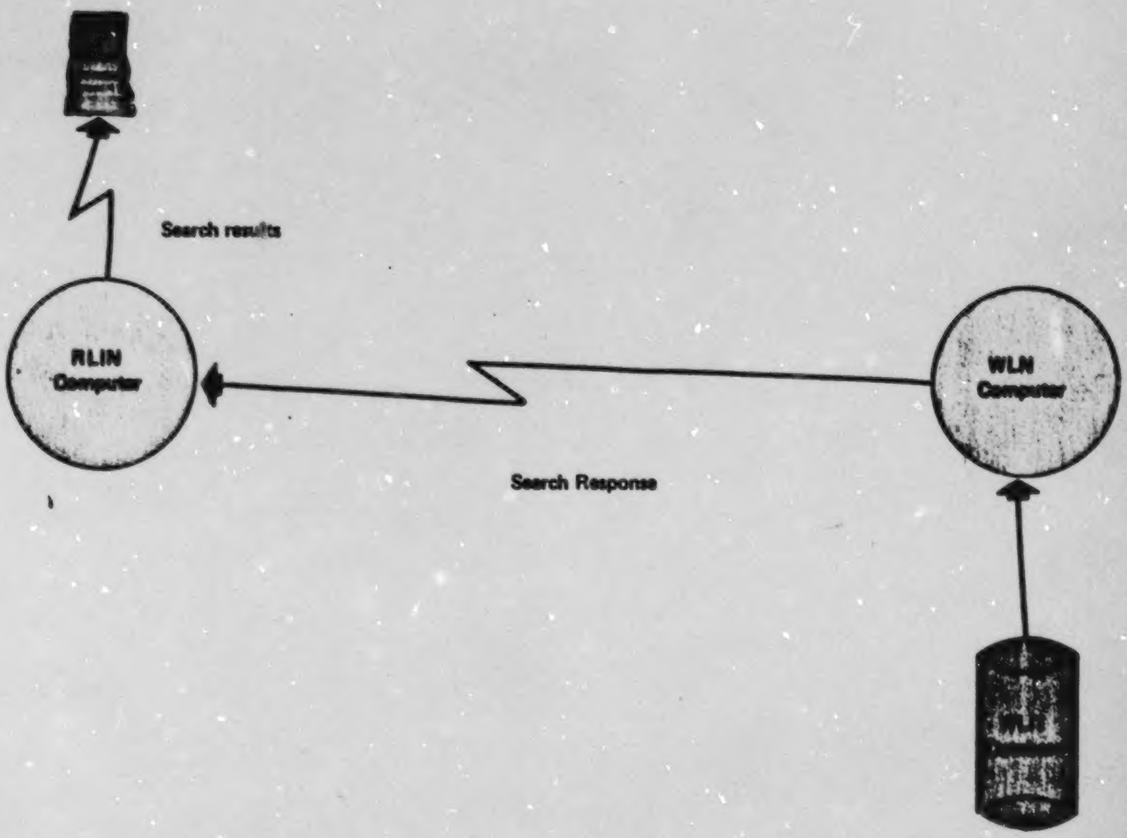

Search results
RLIN Computer
WLN Computer
Search Response

Figure 7

Paper No. 5

THE RESEARCH LIBRARIES GROUP, INC.
INTERNATIONAL CONFERENCE ON RESEARCH LIBRARY COOPERATION

Conference Session II
October 2, 1984

"The Consortium of University Research Libraries: A New Cooperative Venture in the U.K."

by
F.W. Ratcliffe
Cambridge University
Cambridge

The Consortium of University Research Libraries: a New Co-operative Venture in the United Kingdom

F. W. Ratcliffe

It may seem premature to make any public statement about a library co-operative group which is barely two years old. After all, there is as yet little positive achievement to report. It was conceived out of chance rather than by design and it was born into adversity, at least in the British university world. Any kind of new venture to-day is likely to incur new expenditure which is hardly propitious in the present state of affairs. Moreover, such a select group as the new body is, with a very small membership, seems to savour of elitism, a highly unpopular word in certain educational vocabularies. It is certain to arouse suspicion and criticism not only from other university libraries but also other libraries outside the university system.

The Consortium is made up of seven university libraries, the largest in the country representing the largest universities, namely, Cambridge, Edinburgh, Glasgow, Leeds, London, Manchester and Oxford. Early in 1982 discussions between the University libraries of Cambridge and London had begun with a view to exploring the possibilities of closer co-operation, particularly but not exclusively in the use of automation. Both libraries had computers for housekeeping processes. Both the Cambridge University Library Computing Department and the Library Resources Co-ordinating Committee at London had been engaged for several years in research and development work in the use of computers for information retrieval as well as integrated packages for acquisition, cataloguing and lending systems. In these discussions it became clear that major improvements in services to scholars and students, but especially to researchers, in both universities would result simply from sharing access to information about each other's holdings.

Over the same period discussions on the sharing of data had also been taking place between the university libraries of Glasgow and Edinburgh. The Cambridge/London discussions were widened to include first these libraries and then those of Leeds, Manchester and Oxford. These seven libraries already owned or had access to a very wide range of computer equipment with automation programmes already in operation. In addition, records of large numbers of books and periodicals were locally available on-line. Most important of all is that the central holdings of these libraries stood in excess of twenty million volumes with several million more in libraries in Cambridge, London and Oxford outside the central libraries. These holdings have been largely assembled for the purpose of teaching and research. Collectively, the seven libraries make an unequalled contribution to the national resources in research material. The comparative strength of their holdings is annually increased by their high rates of current acquisitions. Their acquisitions budgets, taken as a whole, represent a unique investment in research materials in the scholarship of the country.

It is fair to ask whether such a new grouping is necessary, what can it achieve, against a library background which seems already to be dominated by and devoted to co-operation and consortia. What can it offer which is not already on offer through existing agencies? To do justice to these questions it is important to consider briefly not only the developments over the last decade or so of the various library automation co-operatives, but also those two major library organisations in Britain, namely, the Library Association now in its one hundred and seventh year, and the Standing Conference of National and University Libraries (SCONUL), formed thirty-four years ago. The former is the professional association for librarians of all types, the latter represents the interests of national and university libraries through their chief officers or, in their absence, their deputies. There is little possibility of conflict between these two bodies since SCONUL could never be a professional body for librarians in the way that the L.A. is, although inevitably both organisations share many library interests and objectives. Having said that, SCONUL is to some extent bound to be professionally divisive in that it absorbs much of the professional interest and time of the senior staff of the institutions it represents.

In fact, SCONUL grew directly out of the failure of the L.A., in the late forties, to meet the needs of university and national libraries as expressed through the University and Research Section of the L.A. Since its inception, the British L.A. has been dominated by the public libraries, an inevitable consequence of the richness and size of the British public library system. Already before the 1939-45 war, serious thought had been given to the idea of establishing a separate organisation to cater for university libraries. In the immediate post-war period, the L.A.'s insistence on professional qualifications in recruitment and the absence of an adequate platform for academic libraries within the L.A., led to the meetings which subsequently brought about the creation of SCONUL. In the event, the University and Research Section of the L.A., with various changes in title, has continued to provide the main meeting ground for academic librarians in all grades, whilst SCONUL speaks nationally to those matters of special interest to its members. SCONUL was, then, established as a forum in which the common problems of academic libraries could be ventilated, the policies and practices of large research libraries considered and through which their views on national issues could be made heard in the appropriate places. Significantly, the size of the libraries to be invited to join this new body was important in the thinking of the founders and as a fact, not all universities and university colleges were invited to join. This accounts for the apparent anomaly whereby to-day certain major research libraries in Oxford, Cambridge and London are not represented there. The subscription in 1950 was one guinea and the new body operated with club-like efficiency. It accommodated on this basis two quite different types of institution, National Libraries with their civil service, governmental background, and University Libraries with their traditions of autonomy and independence. Its Committee comprised a chairman, an honorary secretary/treasurer and six of the twenty-eight invited members. The emphasis was clearly 'academic' in that it sought to promote research and academic excellence as its *raison d'etre*. The comments of my Cambridge predecessor of the day to the proposal to establish SCONUL are worth recalling in the present context. "I do hope", wrote H. R. Creswick, "that the Conference will make its meetings as few in number as is compatible with the really useful work which could be done, and will not ask its members to embark upon the compilation of returns, statistical or otherwise, or replies to elaborate questionnaires".[1] He was not alone in holding this view, which has not prevailed in subsequent developments.

SCONUL's immediate objective of providing a very necessary meeting place for academic librarians was realised to the full in its early days and the surviving founder members look back with nostalgia at the informality of its successful proceedings. During the sixties and seventies two important national developments took place which had far-reaching effects on the nature of the new body. The first was the expansion of Higher Education and the creation of many more new universities. This brought requests for admission to the 'club' and implied admission to membership of libraries previously excluded. Significantly, the applications to join were held at bay for some considerable time on the grounds that these newly established and rapidly growing institutions posed very different administrative problems to those found in the large established libraries of existing members. In fact, for a while the new university libraries formed an association of their own which was dissolved when membership of SCONUL was finally conceded, albeit with little enthusiasm. This admission of the new universities not only brought in an influx of new member institutions with very different library situations but also from the new technological institutions librarians with a different professional background. The Colleges of Advanced Technology, now created as universities, had recruited librarians in the manner of the Public Library sector, with the traditional emphasis on professional qualifications. This is one of the factors in the growth of 'professionalism' in university libraries or, looked at another way, in the decline of the 'scholar librarian'. In the post-war history of university libraries this may well emerge as a crucial development in recruitment.

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[1] Quoted from T. H. Bowyer, "The founding of the Standing Conference of National and University Libraries" in *University Library History*, edited by J. Thompson, London, Bingley, 1980, p.217/8. This article provides a very full account of the discussions leading to the establishment of SCONUL.

The second change, more obviously relevant to libraries, was the creation of the British Library. This was much more than a simple amalgamation of national libraries into a single library presence; it forged an instrument through which a national library policy could be formulated and put into practice. Although all the proposals were clear at the time, not all libraries, and certainly not all academic libraries, recognised the full implications and were to some extent unprepared for the inevitable change in character which the national institutions would undergo. Rightly or wrongly, but in a thoroughly understandable way, the old British Museum Library shared with university libraries a very special relationship. It was, for example, Frank Francis, later to become Director and Principal Librarian of the British Museum, who moved the resolution at the founding meeting of SCONUL that the new body should be formed and was one of the three librarians who set the whole move towards SCONUL in motion in 1950. His concern about the absence of a voice representing the interests of the national and university libraries in the L.A. reflected the common cause of the research libraries. The B.M. was first and foremost an academic library with few links with the public library world. From being the province and backstop of university and research libraries, the B.M. has become, as the Reference Division of the British Library, the property of all libraries. In a way it was promoted out of the university league into one of its own. Under the British Museum Trustees, its Civil Service or governmental nature had always been muted, though always there. As the Reference Division it could only change, being part of the British Library, itself headed by a career civil servant as its chief executive. The change in the special relationship was bound to be reflected in SCONUL. Nowhere was this more in evidence than during the debate on the Atkinson Report of the UGC 2) where the role of the British Library was ambiguous to say the least.

This should not be interpreted as criticism of the British Library which now discharges a long overdue role at a national level, a role unthinkable either in terms of the old B.M. or of the other formerly independent libraries. In the course of the re-organisation it has also become evident that the British Library is much more 'professional' than its earlier counterpart. Its repercussions on a body like SCONUL have been

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2) University Grants Committee, Capital Provision for University Libraries: Report of a Working Party (Chairman R. Atkinson), London, H.M.S.O., 1976.

gradual, almost imperceptible. The change did not even mean that its representation in the membership of that body increased significantly though its large subscription might well justify such thinking. Yet, it happened in the case of the Atkinson Report and it is certain to happen again that the independent autonomous university libraries must find their civil service counterparts not so much in tune with their aims and interests as they were in the past. The relationship of the universities themselves with the University Grants Committee, which is not in theory an agency of government, is instructive in this connection. It should be recalled that in the discussions leading to the establishment of SCONUL, a minority view was expressed that the new body should be for university and college libraries alone, because of the quite different backgrounds of the libraries.

The expansion of SCONUL took place before the formation of the British Library. So too did the change from a 'club' with its one guinea membership fee to an organisation with its own secretariat and subscriptions for larger members well into four figures. The voting principles have remained the same, for the most part one member institution one vote. What began as a highly select homogeneous group of major academic libraries, discussing matters of common concern, has become a much more numerous and disparate gathering still discussing matters of common concern but necessarily in terms which must reflect the interests of the whole body. It follows too that on occasion the secretariat is likely to speak for its members and express views on their behalf, a not altogether desirable development from the viewpoint of the major university libraries, which constitute a clear minority in such a membership. At a meeting of the SCONUL Council in February 1984 it "was considered inappropriate to establish an Advisory Committee to handle special interests of the large university research library". This is reminiscent of the L.A.'s rejection of its University and Research Section's arguments for a stronger voice which was to be an important contributory factor leading to the founding of SCONUL. Nonetheless, major research libraries have quite specific problems. In recent time, the librarians of these libraries have discussed these problems at SCONUL conferences but outside the scheduled meetings.

It has to be said, however, that it is not only qualms about SCONUL, the changing nature of its membership, which has led to the formation of the new Consortium. After all, only one of the seven members has withdrawn from SCONUL. There are a variety of factors which have contributed. Among these and one of considerable importance has been the emergence during the seventies of library automation co-operatives. It is no accident that the five English university libraries in the Consortium have found themselves unable to participate in such a co-operative. In fact, when the co-operatives were coming into being the extensive acquisitions of these individual libraries often approached the total range of titles taken by the co-operative itself. The in-put by the major libraries would have been balanced in no way by the amount which could be extracted. The format of catalogue entry, the adoption of AACR 1 or 2, posed extreme difficulties for very large collections. It will be recalled that the first indication of a troubled financial future hit British universities in 1975. The economic difficulties then were, in fact, as nothing compared to those experienced in subsequent times. Even if the incentive had been there, the means to finance some of the necessary changes would have been difficult if not impossible to find.

The very large holdings held by these libraries also constituted a problem, apart from their cataloguing eccentricities. Large libraries with long histories present peculiar problems of automation. Cambridge University Library and the John Rylands University Library of Manchester, for example, each have libraries within the library itself, often with their own catalogues which, though more than adequate for users, are incompatible with each other let alone with AACR in MARC format. As possible subjects for retrospective conversion, all the libraries share the difficulties of GK3 within the British Library and though not of the same huge order, none the less on a very large scale. Since their staffing has never been such as to repair the shortcomings of the past, the idea of retrospective conversion presents problems of finance far outstripping income, whether recurrent or non-recurrent. In 1981/2 Cambridge University Library saw a solution to its problems in the use of OCLC. It foundered on the basis of costs. The principle of spending now and saving recurrent costs later is one which the administration of Cambridge University is not alone in viewing with some scepticism. It has to be said too that not all librarians are convinced of the undiluted benefit of centralised cataloguing which, in the main, certainly as far as costs go, have still to be realised in this country. Having said that, it should be emphasised that this does not denote some kind of latent Luddism, some doubt as to the value of automated techniques generally. On the contrary, the investment of members of the Consortium in computing, library for library, is probably greater than in most other university libraries in Britain. Some espoused at an early stage AACR. Cambridge largely abandoned its old catalogues in 1978, to the anguish it seems in retrospect of the entire university, and started a new microfiche catalogue using AACR 1, based to a large extent on British Library exchange tapes. London University Library had done much the same and had begun an internal network within the London University Colleges, (University of London Shared Cataloguing System). In Scotland, both Glasgow and Edinburgh belonged to the Scottish Co-operative, SCOLCAP, and were developing similarly. Each of the seven libraries had involvement in depth in automation and the experience gained from these activities was in itself a factor in the establishing of the Consortium.

It will be evident that CURL has some of the distinguishing marks of a library automation co-operative. As such its appearance can only be to the benefit of the research community generally. Certainly, it might be thought that its formation was timely, coinciding as it did with the publication of the Library and Information Services Council's The future Development of Libraries and Information Services.[3] One of the main spurs to forming the Consortium came indirectly from the existing co-operatives. These formed in 1980, along with the British Library, the Co-operative Automation Group (C.A.G.) under the Chairmanship of the Chief Executive of the British Library. The proposals of this body in 1983 to establish a United Kingdom Library Database System, (UKLDS), seemed to exclude participation by individual libraries, or at least give little opportunity for their participation. The possible omission of the major research resource, which the holdings of these libraries outside co-operatives comprise, was a matter for serious concern. The projected UKLDS has since been abandoned, as reported in the August 1984 issue of the Library Association Record, (p.289). The potential of the data-base of the libraries of the Consortium falls not far short of that envisaged by UKLDS.

It is interesting to consider the Consortium in the context of the co-operatives from which it differs in a number of fundamental ways. They exist to provide their members with computer based services for the sharing of bibliographical data at an economic cost and operate largely on a regional basis. This presupposes some kind of administrative structure which CURL does not intend introducing. CURL sets out to develop common access to collections not to expand good housekeeping services in each member library such as automated or shared cataloguing. If this can be achieved it will not only lay open to researchers a very large research resource, it will also provide a new dimension for acquisitions and collection building, answer innumerable cataloguing queries, and improve inter-library lending facilities. The immediate need is to create the necessary research and development capacity to investigate the problems involved in access. To this end a significant grant has already been received from a charitable trust for the purchase of hardware and the Consortium has been encouraged to think that further assistance with software and expertise might be forthcoming. These investigations are to be carried out at Leeds University and the necessary research conducted in co-operation with the University's computing services. From the start the Consortium has attracted the active attention of the computing centres of each of the seven universities and is already benefiting from their advice and assistance.

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[3] London, HMSO, 1982.

The novel element in this undertaking lies in the decision not to pursue shared cataloguing and a centralised data-base. In the initial discussions between Cambridge and London it was agreed that the existing incompatabilities in their library and automation practices were such as to render any proposal to unify holdings into one catalogue otiose. Experience in both libraries showed that whatever records came into the library, even where the MARC format applied, some kind of editorial action was often necessary. It was accepted that the basic requirement was to secure access to the information and the format in which it was acquired was to a large extent incidental if not irrelevant. The Consortium generally shared this view given the wide variety of formats which obtained in the seven libraries and since the cost implication of centralised cataloguing for the individual libraries was prohibitively high. The concept of a distributed data-base, however, offered a maximum of information return on a minimum investment. Moreover, the existence of the Packet Switching System and of the academic data transmission network being developed at Leeds University made such a data-base immediately feasible whilst enabling each university to continue its present practices and without the need for vast programmes of re-cataloguing according to a common format. The immediate priority was to establish the necessary links and protocols for each university library to connect to a national network. Such retrospective computerising of card and book catalogues as is already in progress, along with future conversions, will be equally available for consultation at any of the seven libraries.

Advances in technology have already overtaken the earliest objective so that it is already possible to obtain access on-line by most of the CURL members to each other. Very much experimental at this stage, future development must depend on the availability of terminals, network lines and upgraded dedicated computers. A library project in Cambridge University Library makes possible a contribution which underlines the importance of this development. Within the last two years an on-line short-title catalogue has been developed encompassing the contents of the COM fiche catalogue introduced in 1978. This has had such initial success that it is being adapted and expanded to serve as the main library catalogue. Derived from the tapes of the COM catalogue, it aims within the next few years to incorporate the numerous Departmental/ Faculty libraries in Cambridge University, subject to available finance. Given the Copyright deposit status of the Library and its large acquisitions budget, this provides access to numerous publications, both British and foreign, of the last six years. It is immediately comprehensible to staff and users in Cambridge and the other CURL librarians see no problems in its use in their universities. The fact is that most university library users are accustomed to a variety of catalogues. Bearing in mind the initial reaction in Cambridge to the microfiche catalogue, this development has been greeted by users in general with acclaim.

It is not necessary to detail the various stages of development to be undertaken in this first major enterprise, the establishment of network communications between members of the Consortium. Given the initial grant and the prospect of further assistance, CURL members are in no doubt that they can all be achieved. The project is also bringing results of another, gratifying kind. Firstly, as already mentioned, the Computing Centres within individual universities have responded warmly to this CURL initiative. It has also strengthened relations with their libraries whilst providing an object lesson in co-operation between departments within universities. Secondly, in a time of retrenchment, the development of CURL is demonstrating to their parent universities and to the UGC one possible way in which limited funding may be stretched. Viewed purely as a public relations exercise it can only have been beneficial for the libraries.

Within the purely library context it has also stimulated some debate on the long-term implications of centralised cataloguing for librarianship as a graduate profession and raised again the long-standing questions as to the function of the catalogue, bibliographical tool or finding list. It is not proposed to discuss these here except to comment that it seems unfortunate in Britain when the LA has finally been committed to an all graduate profession that technical expertise should be substituted for graduate work in what have been traditionally the power-houses of scholarship in university libraries. In the older university libraries the cataloguing and classifying department has been the hub of the library which touched on all other departmental work. Tedious though much of the work may have been it was directly relevant to the scholarship of the place.

It has been indicated that CURL has objectives other than library automation, although this inevitably has dominated much of its early business. Meetings of the librarians are held regularly in member libraries. They are informal with a minimum of paperwork and discuss topics raised by the members. The only problem so far has been that there have been more subjects for discussion than time available. Minutes of the meetings, in the form of a descriptive account, are kept and circulated to members. In this respect the Consortium is especially fortunate. The Librarian Emeritus of London University, D. Foskett, who was involved in the initial discussions with Cambridge, acts as Honorary Secretary in retirement. A good example of the potential of the new Consortium arose early in 1984 through the so-called "great debate" on the future of universities initiated by the UGC.4) Although SCONUL was to express a collec-

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4) University Grants Committee. Development of a Strategy for Higher Education into the 1990s, letter from the Chairman of the UGC, 1 November 1983, to universities.

tive view, there seemed little likelihood of conveying through that body the specific views of CURL. Moreover, the responses of individual universities were such that though university library views were requested by and submitted to parent universities, the amount of information obtained university-wide left little opportunity for any specific reference to library considerations. CURL was able to speak directly to those questions raised by the UGC which were of special relevance to research in terms of library provision. In fact, this was probably the only means of presenting the collective views of the major university libraries to the UGC.

Matters discussed naturally reflect many of the subjects under discussion in the library world at large. For example, with conservation so much to the fore in library thinking, co-operative purchase of acid-free boxes, the publishing of items on acid-free paper, the incorporation of commercially available microform collections into the Bodleian list of microform holdings, which exists as a computer file, and related matters have been the subject of discussion and agreed action. Copyright and the problems of multiple copying have been considered, as have letters of approach to publishers seeking copying permission. Contact is being made with the Publishers' Association on a number of issues, on methods of book-production among others. Security, book losses, purchasing policies, recruitment and staff training, exhibition and teaching programmes, are among matters to be discussed at future meetings and retrospective conversion of records is bound to figure prominently until it has been resolved. The small membership of the group and their community of interests ensure profitable discussion of problems with positive results.

There is little to be gained, however, by listing at length all the subjects of interest to the Consortium: quite clearly, it aims to be much more than another Library Automation Co-operative. Very important among the matters discussed and for discussion is the relationship of the group with other bodies. Of those mentioned in this paper the Library Association gives rise to no problems for the same reasons that allow SCONUL to flourish alongside it. SCONUL is in a different position since the Consortium offers benefits to its members not to be found in that body. At present only Glasgow University, whose Librarian significantly was formerly Secretary of SCONUL, has withdrawn from membership. It would be dishonest, however, not to admit that other members of CURL have not considered how much more immediately effective their four-figure subscription might be if put at the disposal of CURL. £7,000 or so a year could help realise many of the objectives within a much shorter period of time. As far as the Library Automation Co-operatives go, the modus operandi of CURL and its objectives are so far removed from their own that it can only be hoped that co-operation will be possible as opportunities arise.

The most important of these relationships is that with the British Library. There is no doubt in the Consortium that this needs to be as close as possible whilst accepting that as a non-university institution it cannot become a member in the full sense. It is likely that the Director General of the Reference Division will be invited as an observer or, if willing, co-opted to membership, not only to provide the very necessary liaison with the British Library, but also as a mark of the Consortium's goodwill towards the British Library. It is not the intention of the Consortium to mount what may well prove to be a major co-operative venture without the support of or at the expense of the British Library. On the contrary, it is hoped that the Consortium will shortly be in a position to bring positive initiatives to the Library in the hope that they will be taken up by that body. The Consortium is fortunate in that all of its members serve in some capacity on British Library Committees so that close links exist which can be fostered. It looks forward to much profitable co-operation with the Library by involving it as closely as possible in its deliberations.

It will not have escaped notice that two of the members, the Bodleian and Cambridge University Libraries, are legal deposit or copyright libraries. As such they subscribe to the Copyright Agency in London which acts on behalf of the National Libraries of Scotland and Wales, and the university libraries of Cambridge, Oxford and Trinity College, Dublin, in the acquisition of the material deposited. This provides a very special link with the other two National Libraries and, since the Agency is working closely with the British Library Copyright Office in the introduction of automated procedures, yet again with the British Library. This will enable the Consortium to maintain close liaison also with the National Libraries of Scotland and Wales, which as major research libraries are likely to be interested in the activities of the Consortium. The fact that Glasgow and Edinburgh are members of the Scottish Co-operative, SCOLCAP, along with the National Library of Scotland, strengthens that position.

To speak of the future with so little of the past behind us would be presumptuous. Much will depend on the librarians of the seven libraries, on the importance they themselves attach to the venture. At present it seems unlikely that the present guidelines for membership will change, that is university status, not less than 10,000 full-time students and an enthusiasm to make the most of immensely valuable resources for all members of the Consortium. It is unlikely that subscriptions will be levied or paid officers employed and certainly no such ambitious enterprise as that of the RLG or even SCONUL is contemplated. As an academic resource, the collective holdings and purchasing power of the Consortium must have few equals in the United Kingdom. The collective expertise available, whether in librarianship or automation, must also represent along with their considerable investment in computing equipment a significant force. If this can be welded into the kind of co-operative agency which the members have in mind, the library world in the United Kingdom should hear much more of CURL.

Paper No. 6

THE RESEARCH LIBRARIES GROUP, INC.
INTERNATIONAL CONFERENCE ON RESEARCH LIBRARY COOPERATION

Conference Session II
October 2, 1984

"Setting Up a Network of 'Responsibility Libraries' in Sweden"

by

Kari Marklund
University of Lund
Lund

"A system of special national libraries"

"Where a nation is responsible for funding library services the resources of the libraries should be considered a national resource"

1. INTRODUCTION

The Swedish Government decided on July 14th 1979 that an investigation into the problems of establishing "A system of responsibility libraries" should be made. The Council for Scientific and Technical informationprovision (DFI in Swedish) was mandated to undertake the investigation.

DFI commissioned a working group (of which the author was a member) in april 1980 to investigate the possibility of special national libraries within the country. The planning model set up by the working group involved three stages.
Stage one: Develop models for the development of a responsibility library system.
Stage two: Test the models by field experiments.
Stage three: Evaluate the field experiments and the investigations made and put forward the final suggestions to DFI. The process chosen is a common regenerative process in which information derived contritutes to the generation of new hypotheses that must be researched and tested.

The final report was submitted in March 1983 and proposed a gradual establishment of subject specialized libraries, each such library being given, in additional to its local responsibilities, a national responsibility within its special subject field. This report was, as is always done in Sweden, circulated for comment. After this usual consultative round, producing some criticism of various parts of the proposals, DFI submitted a modified version to the Government.

In April 1984 in a comprehensive Government bill outlining a national research policy, we were able to see the final result.

2. HISTORICAL BACKGROUND

Acquisitions

Swedish research libraries have always been very closely associated with research and higher education and with the institutions pertaining to such activities. Large research libraries unassociated with any higher education have been rare. The size of the country and its resources have precluded such a luxury. The most notably exceptions to-day being the Royal Library, which is the national

library, the library of Parliament, and the National Library of Psychology and Education. In addition there are the smaller libraries of a number of academies, museums and government authorities.
Already in 1695 the first attempts to establish resource sharing among the Swedish university libraries was investigated. But due to some local objections against the idea it was dropped.

University libraries have no national duty laid upon them. Usually they have entered interlending schemes and cooperative acquisition programs on a voluntarily basis to obtain reciprocal benefits. For small countries there is a case to combine their efforts for a more complete coverage of the litterature with their neighbours. The most famous effect is the Scandia Plan. My colleague Lars-Erik Sanner, present at this meeting, has been deeply involved in this plan. Its aim, according to the new status of 1973 "is to develop rational and economic forms of co-operation in the field of litterature acquisition and related information service ... in the Nordic countries."
There are some significant points to be noted in connection with the scheme.

1. It is a voluntary association of libraries
2. No outside funding
3. The plan does not include the most used litterature which libraries are expected to purchase for local needs.

Higher education

In 1977 the Swedish system for higher education was administratively changed as a comprehensive reform of the higher educational institutions was adopted. The country was divided into six regions, each region with a regional university and several smaller decentralized two and three year colleges. The map in figure 1. outlines the general feature.

Before the restructuring in 1977 the university libraries recieved earmarked funds from the Government, whereas now the size of each library's grant is entirely in the hand of the local University Board. This model advocates maintaining the research libraries within the framework of research and education by fitting the structure of the library and information system to alterations, in the structure of the universities and other institutions of higher education. Further it implies an integrated control of developments in the library and I & D fields. The tendency towards separating the libraries from the field of information and documentation is broken.
The local autonomy of the universities and the library's dependence on local circumstances is a weakness. The budgeting system takes no account of the traditional role that university libraries play in the total national information

network made up of all Swedish libraries irrespective of category by means of interlibrary lending, or of the often considerable local service to users not attached to the university. As a matter of fact the libraries of the six regional universities (the six largest ones) were officially recognized as central libraries each in its own university region, implying some sort of special although never clearly defined responsibility.

Swedish research

In fig 2 the size, population etc of Sweden are shown. It is important to stress that Sweden is a small country compared to the United States and only something between 1 and 2 % of the research and development in the world take place here. This fact can also be verified by a citation analysis. Depending on the subject area, between 1 and 2 % of the citations in the scientific journals are references to Swedish work.

In recent years such figures have led to greater awareness that everything possible must be done to maintain a reasonable level of information provision and library service. Since Sweden produces no more than 2 % of the world total research output it has to rely on importing information about the remaining 98-99 %.

3. THE INVESTIGATION

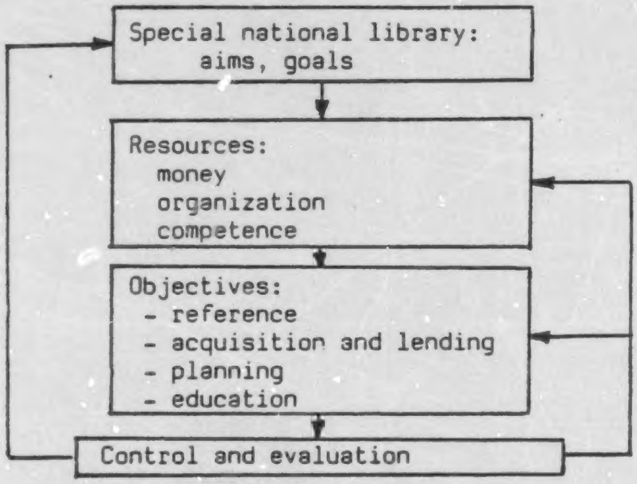
Historical facts, and questionnaries to libraries and users during 1980 clearly indicated that any responsibility library networking system should build on strengths in individual libraries. The idea of a central lending library was not realistic. The idea was also dropped in the face of widespread concern that such a library would swallow to much money and decrease funds for other libraries.

The German schemes are based on decentralization; the major libraries, e.g. the Bavarian State Library and the "national" libraries in Berlin and Frankfurt together with university libraries and other designated special collections, making the network for access to the total scholary national resources. The German schema was studied and was used as a starting base for special national library developments in Sweden. The Swedish system should, however, aim at not only promptly delivering bibliographically known publications but include other duties such as I & D and user education.

In stage one it was defined that a special national library was a library that within its subject or sectorial area should provide services and develop collections above that is normally required from any efficient research library. It should, in addition to other duties, be responsible for reference service, subject indexing, and national participation in international information systems, should take initiative in constructing data bases, organize interlibrary lending, provide referrals to other information, (since 1977 the trend has been towards an integration of the library and the I & D field) services in the field, and monitor the need for training of and information to users and staff. All this was put together into four areas

- reference
- acquisition and lending
- planning and development
- education

Picture 1 shows the connections between aims, resources and stearing within the system of responsibility libraries.


Special national library:
aims, goals
Resources:
money
organization
competence
Objectives:
- reference
- acquisition and lending
- planning
- education
Control and evaluation

A measure on the effectiveness is that the user obtains needed information quicker than earlier.

During stage two the above ideas were tested within three different structures. 1.a sectorial area - wood and pulp research, 2. within a subject area involving all major universities - sociology, and 3. a combination of both; a subject which at the same is applied - medicine.

The results of these projects, running for a year, established a few criteria and also showd that models 1 and 2 do not fullfill the criteria while model 3 did. These criteria are based mainly around

- user needs
- size of the subject or sectorial area
- the structure of information provision
- possibilities to delimit the area

Certain demands must also be fulfilled by the institution wanting to be in charge of a responsibility area.

- competence
- continuity
- accessibility
- co-operation

The final report advocated a division into fairly broad and extensive sectors of responsibility according to what is termed "the subject structure of research" within the Swedish university system. It was recognized that a few such sectors already exist. In medicine, and agriculture and forestry, there are already libraries performing some national functions of the kind earlier described, thus being the obvious choice, whereas in most fields there is need for further investigation before any action can be taken e.g. technology. (There are six technological universities in Sweden). The report stresses the necessity to create close correlations between research and development, and information provision.

In the system suggested there will, if appropriate, often be several co-operating libraries. This means that a single library must not undertake the responsibility for all services or maintain complete holdings within its special field. The term associated national responsibility libraries is used. An associated national special library is assured to have the same competence and library functions as the main national special library in the area, except planning and development. This is the duty of the main library.

The Minister of Education recommends, in the earlier mentioned bill, the gradual establishment of a national system of special libraries escentially along the lines proposed by DFI. In its first stage, however, it should only be introduced to subject areas where current conditions make it appropriate and expedient, and that it does not seem likely that it will ever be suitable for all areas. The Library and Information Centre at the Caroline Institute in Stockholm is designated as the library nationally responsible for medicine as from July 1st this year. The Minister of Agriculture, under whose jurisdiction the Library of the Swedish University of Agricultural Science falls says that that library should assure the same responsibility for the fields of agriculture, forestry, and veterinary science. No further such decisions are to be taken at this point. DFI is instructed to follow development closely, to evaluate results and to investigate the area of technology as the next extension of the system.

Acquisition policies on the local level are emerging in several subject areas. An efficient location system exists within the computerized union catalogue LIBRIS. A computerized Scandinavian union catalogue covering technology and science is under development in Denmark. Tapes covering technology and science from the different union catalogues of the Scandinavian countries are merged into one database at the University of Technology in Lyngby, Denmark. The Skandia Plan is the basis for this co-operative venture and the Library of the Royal Institute of Technology in Stockholm has acted as if it were a responsibility library within technology (Remember the broad scope of duties p.)

4. QUESTIONS

Some of the major questions which arise in considering the relationship between DFI and the libraries in a network is; How far should DFI be responsible for planning and managing the nation's library resources taking into account the decentralized decision making within the universities? Should its leadership be firm or should it be confined to suggestions on policies and supervise their carrying out? Should DFI have some control of the National Library in a responsibility library system?

Should the participation of associated libraries be on a voluntary basis even within an official co-ordinating structure for networking?

How can the participating libraries within the national network and within the subject specialized network be given equal opportunities to participate in the decision making that affects the distribution of funds and the formulation of policies?

Shall all the collections in a university be available on the same basis as collections in the central university library in order to make fullest contribution to the different subject fields?

How should a co-operative policy to increase the library resources of the nation be implemented with funds for all expenses incurred - purchase, staff, services, and international co-operation?

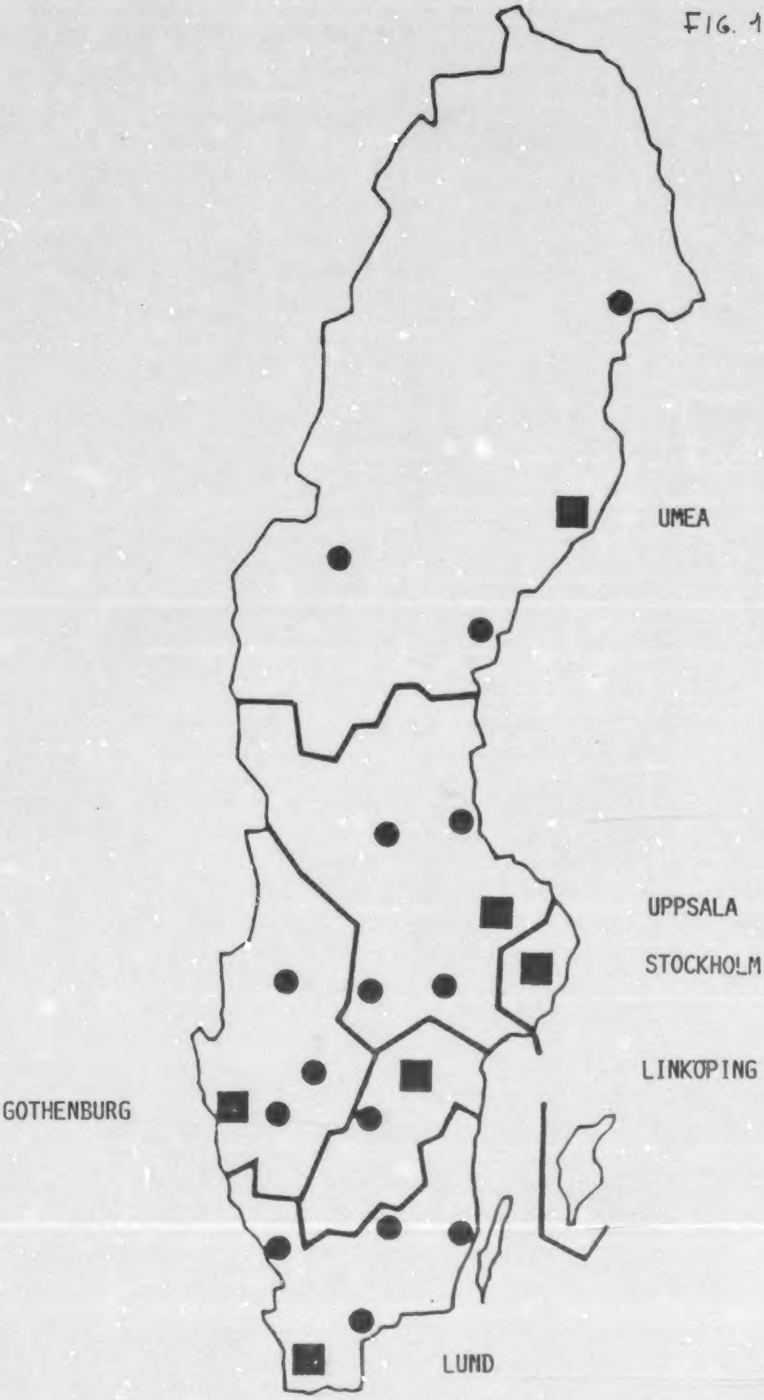
Information technology will change our concept of information. Libraries at least have tended to equate information with print on paper but this position will be increasingly impossible to maintain. More and more information will be transmitted but not printed and also the recording of information will no longer always be in fixed forms (the printed page, the film etc). Our attitudes to national archives and co-operative collection developments will have to change. The libraries will have to devote less attention to storage and more to transmission. Does the new information technology make the responsibility library system obsolete before it is fully developed?

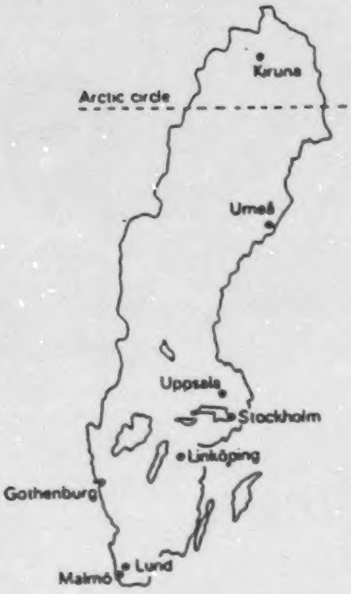
Intermediaries will become important in an "electronic publishing world". Very much in the same way as data-base operators are already of major importance in handling bibliographic files. Publishers might not wish to maintain their own files for direct access by users. This is another consideration which might affect the network of responsibility libraries in as much as there might be a clash between private and public sectors. A privatezised facility would be uneconomic if it handled but the medium and high-use items, and the remainder would have to become unobtainable. Shall the responsibility libraries handle the low-use items and to what cost?

Cost analysis is extremely difficult on account of the many differences among Swedish research libraries, both as regards material, users, administration and field of coverage. If a cost-benefit and cost-effectiveness analysis of the research library system is considered unrealistic, how can some criteria be established which might be helpful in overall distribution of resources?

Usually responsibilites are given to libraries with a long tradition. If the research funding policy is to establish new fast growing research fields to new sites, how do you handle the tradition vs renewing problem?

FIG. 1.


UMEA
UPPSALA
STOCKHOLM
LINKÖPING
GOTHENBURG
LUND



Area: 449,793 km^2 (173,654 sq. miles)

forests	50 %
cultivated land	10 %
other land	31 %
lakes	9 %

Population: 8,236,000 inh.

Population density:
20 inh./km^2 (52 inh./sq. mile)

Major cities:

Stockholm	1,364,000
Gothenburg	692,000
Malmö	453,000

Length north-south:
1,574 km (977 miles)

Industrial output	1950	1970	1980	1982
Index 1968 = 100....................	43	114	125	125
Gross domestic product, consumption and investment. Current prices				
Gross domestic product, market prices, M Skr.......................	32,040	168,900	525,100	624,080
per capita, Skr.................	4,550	20,870	63,185	74,970
Private consumption, M Skr.........	22,080	91,500	270,050	333,400
per capita,Skr..................	3,135	11,305	32,460	40,050
Public consumption, M Skr..........	4,195	37,500	153,160	185,470
Private investment excl. dwellings, M Skr..............................	2,775	14,360	18,430	22,280
Public investment, incl. roads, schools, hospitals, and defence, etc., M Skr........................	1,610	14,455	42,990	48,290

SCB 1983-07-12

FIG. 2.

Paper No. 7

THE RESEARCH LIBRARIES GROUP, INC.
INTERNATIONAL CONFERENCE ON RESEARCH LIBRARY COOPERATION

Conference Session II
October 2, 1984

"Resource Sharing among Research Libraries: How it Ought to Work"

by
Richard M. Dougherty
University of Michigan
Ann Arbor

REQUIREMENTS FOR RESOURCE SHARING AMONG RESEARCH LIBRARIES IN THE INTERNATIONAL ARENA

Richard M. Dougherty
Director, University Library

No research library is self-sufficient; universally this is an accepted truism. Thus the inevitable interdependencies among libraries explains why academic research librarians have devoted so much time and energy toward improving resource sharing arrangements and interlending systems.

Each of the countries represented at this meeting can point with justifiable pride to significant progress in developing national programs for sharing library resources. Moreover, programs such as UAP (Universal Availability of Publications) reflect current efforts to extend resource sharing beyond borders.

Recent resource sharing developments, though encouraging, have also surfaced issues that, if left unresolved, could lead to restrictive barriers. I am referring to concerns such as mounting costs of lending and borrowing and preservation of collections. Our objective is to forge agreements that will ensure the perpetuation of unfettered resource sharing among the western world's research libraries.[1]

It was not too long ago that many government officials and academic officers viewed resource sharing as a substitute for building adequate research library collections. This tendency has been described by Geroge Jefferson.[2] Jefferson points out that in the post-war period interlending between libraries was widely interpreted as a synonym for library cooperation. One undesirable result of this interpretation was the use of interlending as a prop by some institutions. Instead of being used as a means of temporarily supplementing the resources of a library in a positive manner to insure that the more specialized or infrequently used books at the fringe of a library's book selection policy were available to its readers, too often the interlending system was used as a substitute for book purchase. In the United States this misapplication of the concept of resource sharing has actually inhibited the growth of some research libraries. One of my colleagues once expressed this philosophy as "sharing of poverty." If carried to an extreme one might ask how scholars would obtain research materials if all libraries deferred purchases, depending on the largesse of others.

The philosophy espoused by the Research Libraries Group has clearly placed resource sharing in a more appropriate perspective. We are, as Jefferson reminds us, employing cooperation in a positive manner, insuring that books at the margin of a library's book selection policy can be made available to readers. And more recently the International Federation of Library Associations' (IFLA) Universal Availability of Publications (UAP) program has sharpened the focus of international agencies, library officials, and users of libraries on the potential and problems of resource sharing across national boundaries.

The concept behind the UAP program is straightforward. It seeks to achieve "the widest possible availability of published material . . . to intending users, wherever and whenever they need it."[3] Although the goal is probably unattainable, the UAP concept has energized efforts to improve availability in a number of countries and consequently the UAP effort will nudge us closer toward the ideal of universal availability than otherwise would have been possible.

The Current Scene

A review of recent literature reveals that resource sharing has expanded rapidly throughout the industrialized world in recent years. The volume of interlibrary lending traffic seems to have grown steadily over the last decade and a half. This seems to have been universally true, but the structures of interlending systems which have developed have varied greatly from country to country. For example, in the UK the resource sharing system is based on a central lending collection (covering all significant serials and reports, and all significant recent English language monographs) supported by union catalogs (national and regional) and several large libraries. In the Federal German Republic, the Deutsche Forschungsgemeinschaft organized in 1949 a supraregional system of literature provision based on two state libraries, four central subject libraries, fifteen university libraries, and thirteen special libraries.[4] In Sweden and Denmark the systems are essentially decentralized although there are some elements of centralization. In Denmark the system is based on a network of public libraries and on research libraries for some specialized subjects. The system in Sweden is decentralized, but four major research libraries and a selection of special libraries offer international lending services.[5] In the Netherlands one finds another form of a structure. Union catalogs are maintained by the Royal Library and the Technical University at Delft. Nonetheless, research libraries lend freely to others and thirteen large public libraries act as regional support for scholarly literature for their respective regions.[6] And finally, in the United States the network of over a hundred research libraries cooperate in consortia such as RLG and OCLC, but the resource sharing can be characterized as largely decentralized.

Often the structures which emerged in the years following World War II reflected the economic and social conditions and political attitudes of the individual countries. And, this diversity must be taken into account by those who undertake to plan supranational programs of resource sharing and interlending systems.

Now, as we consider new approaches to international resource sharing, how can we build on recent efforts, which model should we adopt? This question has been raised numerous times, but in this context the question may be irrelevant. Researchers have attempted to measure effectiveness of the various organizational structures, but I believe it is safe to conclude that no specific structure has shown itself to be superior under all circumstances.[7] Furthermore, operational effectiveness alone is unlikely to convince a country to scrap or overhaul its existing system. Therefore, we can assume that any international program of resource sharing must complement the existing national or supranational plans. We as research librarians cannot hope to restructure existing national interlending systems simply to accommodate the needs of scholars. I am convinced, however, it is possible to accommodate our special needs if we are willing to redefine carefully our resource sharing objectives and to tailor our plans accordingly.

In order to understand better the options available to us, it might be useful to review briefly some recent significant developments.

The Golden Age of Resource Sharing

I have already mentioned the impressive contributions of the British Lending Library and the more recent impetus provided by IFLA's UAP. Less obvious, but also a contributing factor, has been the growth in the number and coverage of union catalogs in many countries. In the United States the most significant development has been the appearance of the automated interlibrary lending systems of OCLC and RLG. These systems, drawing data from data bases containing over twenty million titles with information on holding libraries, reduce the paperwork associated with interlending, speed up turnaround times, and enable us to monitor performance in a manner never before possible.

These advancements ushered in the "golden age" of resource sharing and most librarians point to these achievements with pride. And so they should. But at the time we should not ignore the danger signals which loom on the horizon. The heavy volume of interlending is straining tne ability of many libraries to supply materials in a timely manner, and longer delays are becoming common as are complaints of researchers whose expectations of performance are now higher than was previoulsy the case.

The impact of this rapidly escalating volume of resource sharing traffic has been dramatic in the United States. First, our success in providing location information about publications has stimulated new levels of demand which have far outstripped our ability to deliver documents in a timely manner. We could characterize this imbalance as a collision of two eras: the technological age of bibliographical access colliding with the horse-and-buggy era of document delivery. Second, the heavy volume of interlending coupled with on-campus use of collections have accelerated the physical deterioration of collection materials. The acid content of paper in many publications is rendering them too brittle for use and some libraries are already restricting interlending or even local use of some materials.

The greatest threat to the continued unfettered exchange of materials, however, has been the dramatic increase in volume itself. Several years ago Frederick Kilgour analyzed the impact of OCLC on the lending activities of thirty-seven libraries located in the State of Ohio. Kilgour found that the lending rates of the small libraries grew as much as 1,437 percent and in the largest libraries the rate, though much more modest, was an impressive 85.6 percent.[8] Richard De Gennaro more recently observed that the "rationale for free interlibrary loan no longer holds in the new, high-volume, and more demanding resource sharing environment that is being created by the successful computerization of the interlibrary loan location and communication functions through OCLC and other on-line networks."[9] De Gennaro is an astute observer of the library scene and his cautions should not be ignored.

Patterns of Collection Use

Let us for a moment consider some of the dynamics of collection utilization and how these factors imfluence resource sharing among research libraries. First we know that large segments of collections are infrequently used. This conclusion is based on several well-known studies which found that about twenty to twenty-five percent of a university library collection will account for eighty percent of formal circulation within a given year. This pattern of usage also reflects the phenomenon identified by the Bradford-Zipf law.

A second dynamic of collection usage is demonstrated by the data presented by Galvin and Kent in what has become known as the "Pittsburgh Studies." It suggests that even for a multi-year period a sizeable proportion of a research library's collection may not be used. The Kent and Galvin data showed that almost half of the collections of the Pittsburgh University Libraries showed no evidence of formal lending over a five-year period.[10] Although the specific findings of the Pittsburgh studies have been challenged by numerous researchers, most librarins do not challenge the central assertion that a sizeable proportion of the collections showed little evidence of usage.

A third factor to consider is that interlibrary lending accounts for a minute proportion of total lending activity in a research library, or conversely, roughly over ninety-nine percent of all lending is accounted for by intra-campus activities. This pattern of usage has led some librarians to wonder whether there is a danger of spending a disproportionately large share of scarce resources in order to satisfy a very small portion of lending activity.[11] For example, the University of California has spent millions of dollars attempting to link its nine campus libraries into a union catalog. The objective of the Systemwide effort is to stimulate increased resource sharing. Though a laudable objective, unrestrained interlending could add several million dollars in additional costs to services offered by the nine campus libraries. If the University of California libraries were forced to absorb the costs of increased interlending, other services such as reference, bibliographic instruction, and preservation would inevitably suffer. The California model sets forth the current dilemma of balancing the levels of service we would like to provide with the economic realities of this period of fiscal constraint.

What conclusions can we draw from the current state of affairs? Escalating costs, the growing concern over the physical deterioration of collections, and the limitations of document delivery need to be given prominent attention as we lay the groundwork for trans-Atlantic resource sharing. It should be possible to create very effective interlending arrangements within the constraints I've cited if resource sharing among research libraries is designed exclusively to support the research efforts of faculty and doctoral students. The work of undergraduates should be satisfied almost without exception by local collections or by local or regional interlending arrangements. If resource sharing is limited to specialized materials, most of which fall into the category of no-use or infrequently used materials (e.g., publications which often reflect a narrow focus of research, require specialized knowledge or a language facility not widely held) then the volume of lending should remain at manageable levels. Thus the probabilities for long term success will be enhanced.

Rationalized interlending among research libraries could be facilitated if each library carefully analyzed the dynamics of its current borrowing activity, specifically what categories of publication are currently borrowed and for what purposes are they sought. An investigation at the University of Michigan revealed a pattern of borrowing activities that probablly typifies borrowing patterns of libraries on both sides of the Atlantic. The transactions seem to fall into two distinct categories. In the first category, are the majority of requests. These materials are commonly held and usually can be fulfilled from either local or regional sources. In the United States we also have the option of obtaining materials from commercial document delivery agencies. In the second category are the requests for obscure journals, specialized monographs, dissertations, and possibly manuscript material. These items are normally supplied by other large universities, national lending centers such as the BLLD or the Center for Research Libraries, or from the collection of a library in another country.

The difference in criteria used to judge effectiveness of resource sharing is what distinguishes the two categories. In the case of commonly held materials, the customary indicators of performance are speed, cost per transaction, and reliability, whereas in the second category, a higher premium is placed on availability rather than on cost per transaction. Although I am not able to assign precise proportions, I suspect the vast majority of interlibrary borrowing traffic for all of our institutions falls into the first category and only a minority of borrowing transactions truly requires the resources of national lending agencies or large research libraries.

If a specialized interlending system were to take into account the way research library collections are normally used and the existing nature of interlending activities, I believe it is possible to create an effective and affordable interlending network that spans national boundaries. I propose that we as representatives of the research library community undertake to identify those categories of materials most essential to resource sharing among research libraries. These categories might include foreign dissertations, publications of the developing world, and those publications commonly referred to as "grey" literature. Requests for journals and monographs easily obtainable from local sources should not be allowed to clog the channels of interlending and thus they would be excluded through policy declaration.

New Bases for Measuring Performance

Objective assessment of existing interlending programs usually emphasizes how much is lent rather than evaluating what is lent. I propose that we place more emphasis on the what rather than the how much. In fact, I am convinced we should make concerted efforts to keep lending at levels which will not place unmanageable strains on financial resources. The philosophy which translates into "more is better" should give way to a philosophy which places more emphasis on satisfaction rate, speed, and cost. In the context of consortia such as the Research Libraries Group, efforts must also be made to structure lending and borrowing activities so that each institution contributes its fair share to the effort. If, for example, a difference between lending and borrowing develops, net borrowers have an obligation to reimburse the net lenders. The failure to strike a balance will inevitably undermine the program, the partnership being no longer based on equity but rather (although unintentionally) on a parasitic relationship.

My immediate objective is for libraries to analyze carefully the nature of lending and borrowing and to adopt performance measures that are not so heavily weighted toward volume of activity. Finally, librarians must try to identify that particular segment of borrowing activity that can only be fulfilled by colleague institutions. If these requirements can be met, interlending among research libraries should continue to prosper for many years.

Charting a Future Course

Let me introduce briefly what I believe will be our next challenge. If we are able to rationalize successfully interlending, we will then be ready to turn our attention toward the coordination of collection development, an essential ingredient of resource sharing. A recent survey reported by Judith Collins and Ruth Finer suggests there has not been a great deal of coordinated acquisitions planning on a national level.[12] There have been exceptions such as the cooperative efforts funded by the Deutsche Forschungsgemeinschaft. In the United States considerable planning has been accomplished by the Research Libraries Group as evidenced by its collection conspectus project,[13] but as yet very little actual coordinated collection activity has actually occurred.

I suspect that successful coordinated acquisition programs will elude us for many years. This type of activity, which seems so logical, raises a host of complicated political issues in the minds of faculty on campuses. National politics and the need for us as university librarians to respond to the needs of local constituencies are only two of the barriers which must be surmounted. For example, it is difficult to explain to an irate historian, bio-chemist, or political scientist why the library was forced to cancel journals in his discipline but continues to subscribe to periodicals that are intended to support researchers at a distant institution. It is my belief that programs such as the incipient RLG cooperative purchase program can be achieved only if we can find a way to change the attitudes of those who use our collections. We must be able to demonstrate the benefits of such cooperation in order that we might gradually change user attitudes and behaviors. But in order to demonstrate success, we need additional funds ear-marked specifically for the purpose of funding cooperative acquisitions.

Two recent U.S. conferences, attended by foundation officers, faculty, university administrators, and library administrators, focused on the considerable challenge of cooperation in today's political and economic context. The mandate exists to make materials available to scholars, but the necessary redefinition of cooperation has not been embraced nor the implications understood. Jim Haas describes the mandate as it was discussed at these conferences.

> The principle of shared responsibility for building and maintaining comprehensive resources for research and the corollary of assured access by scholars to needed materials and information was assumed [by participants] without question. National distinction is the aggregation of institutional strength, and the issue for attention concerns the retention of strength in chosen areas by individual libraries in a setting of rising costs, growing quantities of recorded information in all forms, and dynamic demand. The key seems to be to create a national setting which will (1) provide more options for individual libraries, (2) provide access to more resources by more users, and (3) improve prospects for building and maintaining, nationally, unmatched resources for research.[14]

Obviously the more difficult challenge will be to "sell" the consequences of this mandate, for it to some extent will require difficult decisions in determining the locus of collecting activity within a cooperative organization.

At the present time we are trapped in a vicious circle. The ideals of cooperation are supported by the economic necessity but challenged by the political reality. We must look to the far-sighted leadership of governmental officials and academic officers who are willing to follow the lead of the FRG and to create a situation in which incentives exist for shared collection development, incentives for libraries and for library users.

Our longer range goal is to develop and enhance shared collection development, bibliographic access, and efficient, affordable document delivery. To the extent these complementary objectives are met, we can guage our success at fulfilling the objective of universal availability of publications.

NOTES

[1] For those not familiar with recent developments on the international scene, I can recommend the writings of Maurice Line who has written extensively on the subject of interlending and resource sharing.

[2] Geroge Jefferson, *Library Co-operation* (London: Andre Deutsch, 1977), p. 32.

[3] International Federation of Library Associations and Institutions. *Medium-Term Programme 1981-1985* (The Hague: IFLA, 1982), p. 59.

[4] R. Landwehrmeyer, "A Planned Decentralized Solution for National Document Supply: The Federal Republic of Germany," *Interlending Review*, 9 (1981).

[5] International Federation of Library Associations. Office for International Lending, *A Brief Guide to Centres of International Lending and Photocopying* by Anne M. Digby and Barry P. Thompson (Boston Spa: IFLA Office for International Lending), 1975.

[6] Antonio A. Briquet de Lemos, *Descriptions of Interlibrary Lending in Various Countries and a Bibliography of Interlibrary Lending* (Boston Spa: IFLA Office for International Lending), 1980.

[7] See, for example: William Y. Arms, "Models for Interlibrary Lending," *Interlending Review* 7 (1979): 130-136; and Maurice B. Line, "National Interlending Systems: Existing Systems and Possible Models," *Interlending Review* 7 (1979): 42-46.

[8] Frederick G. Kilgour, "Interlibrary Loans On-Line," *Library Journal* (February 15, 1979): 463.

[9] Richard De Gennaro, "Resource Sharing in a Network Environment," *Library Journal* (February 1, 1980): 353.

[10] Thomas J. Galvin, and Allen Kent, *A Cost-Benefit Model of Some Critical Library Operations in Terms of Use of Matierals*. *Final Report* (University of Pittsburgh, April 15, 1978).

[11] Samuel Rothstein, "The Extended Library and the Dedicated Library: A Sceptical Outsider Looks at Union Catalogues and Bibliographic Networks," The Future of the Union Catalogue: Proceedings of the International Symposium on the Future of the Union Catalogue, Cataloging & Classification Quarterly, 2 (1982): 110.

[12] Judith Collins and Ruth Finer, "National Acquistion Policies and Systems: An International Perspective," Interlending Review 10 (1982): 111-118.

[13] The Conspectus project is described in detail in Nancy E. Gwinn and Paul H. Mosher, "Coordinating Collection Development: The RLG Conspectus," College and Research Libraries (March 1983): 128-140.

[14] Two Reports on Research Libraries (Washington, D.C.: Council on Library Resources, November 1983), p. 17.

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Paper No. 8

THE RESEARCH LIBRARIES GROUP, INC.
INTERNATIONAL CONFERENCE ON RESEARCH LIBRARY COOPERATION

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"North American Efforts at Worldwide Acquisitions Since 1945"

by
Edward G. Holley
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NORTH AMERICAN EFFORTS AT WORLDWIDE ACQUISITIONS SINCE 1945

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When I was a doctoral student at the University of Illinois in the fifties, the Documents librarian used to tell a wonderful story (doubtless apocryphal) about that great library's total commitment to massive collection building. During World War II the U.S. Navy was planning an invasion of a South Pacific Island. To the Navy's consternation a superseded Hydrographic Office chart was needed but could not be found. The Hydrographic Office, which should have kept its superseded charts for archival purposes, had not done so. An urgent call went out to all the major research libraries in the country. Could one of them supply a copy of this superseded chart? Sure enough, Illinois could, and the war was won!

This story related to me by the Documents Librarian is illustrative of the fact that at Illinois we never threw anything away. No matter how seemingly esoteric, one could never tell whether some future researcher might not need an item which a librarian today believes has little value. Thus our aim was to be as comprehensive as possible in collecting a great storehouse of the world's literature.

Illinois and the Hydrographic Office chart seem to me an important way to begin a discussion of this country's and Canada's efforts in the post-World War II era to acquire, catalog, classify, and make accessible the maximum number of items of potential research value for North American scholarship.

The tradition of massive collection goes back to Harvard's John Langdon Sibley, often maligned for his acquisitive ways, but a librarian devoted to scholarship and learning.

As Rene Bryant has noted, "Long before any of his contemporaries, he recognized the value of ephemera (topical pamphlets, newspapers, manuscript diaries, and letters) and Harvard men who went off to fight on both sides of the Civil War received personal pleas from Sibley to collect such material for the library. The result is that the Civil War section in Harvard's American history collection is uncommonly fine." (Bryant, 1969, p.17).

Thus Sibley laid the foundation for Harvard University's rise to preeminence among American research libraries, a position which it still holds. Harvard President Charles W. Eliot might suggest cooperative storage at the turn of the century as a way to control the mounting flood of material threatening to engulf Harvard yard, but his successors would build ever more stately mansions to provide space for books and researchers. From the far corners of the globe other scholars would use sabbaticals, summer sessions, and academic recesses to make their pilgrimage to the collections in Cambridge, Mass.

Other American universities followed Harvard's lead. William Rainey Harper, with the assistance of John D. Rockefeller's millions, bought an entire bookstore in Berlin in 1891 to launch the new University of Chicago whose library, as a consequence, became immediately one of the largest in the country.

If American librarians have often been criticized for their preoccupation with collection size, they have had good reason for their collection zeal. The country itself was a giant of a country; its expanse from coast to coast was approximately 3000 miles. In the U.S. there were no large collections of manuscripts with an ancestry of hundreds of years or impressive royal collections. With the introduction of the Germanic research methods at Johns Hopkins in 1876 and the thrust toward making higher education both intellectually exciting and pragmatically helpful to society under the Morrill Acts of 1862 and 1890, and aided and abetted by presidents and research faculties, university librarians have literally scoured the globe to build distinguished large collections. As Samuel Rothstein has noted, a chief characteristic of North American libraries is "the problem of mass," which has called for "the development of a whole range of organizational skills ... which transforms an accumulation of books into a library." (Rothstein, 1972, p. 114).

For an indication of the phenomenal growth of U.S.research libraries in the last one hundred years, I have included a table prepared by Hendrik Edelman and G. Marvin Tatum, Jr., which accompanied their review of "The Development of Collections in American University Libraries" (Edelman and Tatum, 1976, pp. 222-243). To cite my example, the University of Illinois, which was established only in 1867, possessed only 11,000 volumes and had granted no doctorates by 1876. In 1975 Illinois possessed five and a half million volumes and graduated 747 doctorates. By 1983 the figures were 6.4 million volumes and 857 doctorates. (ARL Statistics, 1982-83). In the twenty-five year period from 1950 to 1975 the Illinois collections approximately doubled and the number of doctorates produced tripled.

Over the past two decades ARL's university members with more than one million volumes have grown from 11 in 1963 to 104 in 1983. Eight of the latter had more than five million volumes. Harvard, the largest in 1963 with 4.8 million volumes, reached a total of 10.6 million in 1983. Despite some flattening out of the growth pattern in the seventies, the largest libraries continue to maintain their lead. According to a recent dissertation by our doctoral student, Robert Molyneux, they are likely to continue to do so. (Molyneux, 1984).

Now not all persons are impressed with the enormous growth of North American libraries. Some of our European colleagues have criticized the former

British colonies for their inordinate preoccupation with size, noting that the collections contain large amounts of "trash" and that the selection of materials of potential research value has not been as carefully done as might have been desired. (Vosper, 1971; Ratcliffe, 1980, pp. 24-25). This criticism is sometimes heard on American campuses where hard-pressed administrators sometimes focus on the large sums of money needed to acquire, house, and staff the collections (Herbster, 1984; Osburn, 1979). Yet one would have to respond that (1) American university librarians, despite their commitment to worldwide collection efforts, have been notable for their efforts at cooperative enterprises (Weber, 1976), (2) that their universities have added programs, students, and faculties as impressive in size as their libraries have become (Holley, 1975, 1977) and (3) that the library costs, as a proportion of the university budgets have not increased out of proportion to the total university expenditures in the past decade (Holley, 1977).

To cite an example, my own university, which has been criticized for building a new research library building at a cost of $24 million, has completed during the same period a single office and laboratory building for the School of Medicine at a cost of over $18 million. In terms of enrollment, the U.S. student population rose from 2.3 million in 1950 to approximately 12.4 million in 1983. Canadian student population increased similarly. In my opinion many librarians have been much too modest in pushing their claims for library support. As Robert Vosper noted over a decade ago, the major university research libraries are "all unquestionably judged by scholars to be qualitatively among the greatest research libraries of the world and of high distinction in a wide range of disciplines (historical ones and those concerned with contemporary scientific and social problems)." (Vosper, 1971, p.92)

After this note of defensiveness, let me now turn to the topic of North American efforts at worldwide collection building since the end of World War II.

I come back to my Illinois story from the introduction.

An outgrowth of "the War" was a recognition that American collection efforts had been primarily Western European in orientation. World War II revealed major gaps not only in the traditional areas of collecting but also in that vast area of Eastern Europe, especially the Soviet Union. There was also a notable lack of materials about Africa, the Middle East, and Asia. The Farmington Plan, certainly one of the most ambitious collecting efforts ever undertaken by a group of librarians, was conceived in 1942 and initiated in 1948 with the goal of "providing somewhere, somehow in American libraries, at least one copy of every book that may be needed for research." (Vosper, 1971, p.93) Under this plan a large number of libraries "agreed to accept individual responsibility for specified subject fields, and at a later date for specified geographical areas, within which they would receive, catalog, and make available comprehensive collections of currently published foreign books." Though there was a recognition that libraries would be paying for a much larger intake of secondary and peripheral publications than might be needed by local users, the intention of the Farmington Plan was to insure far more extensive collections of research material than had been possible under less coordinated programs.

Criticism attended the Farmington Plan from the beginning. For a long period its greatest success was with Western European publications. Yet Vosper's balanced view of the Farmington Plan seems to me essentially correct. The pattern was set so that when the federal government began its massive support of foreign area studies programs in the late nineteen-fifties the experience of the Farmington Plan could be called upon as a base. The Parry Report (1967) in the United Kingdom echoed the phrases of the Farmington Plan: "we regard as essential that all foreign publications likely to be of value to scholars should be readily found in a British library." (Vosper, p.95)

In the United States the thrust for comprehensive collection building can be seen further in the National Program for Acquisitions and Cataloging (NPAC), the expansion and continuation of twenty years of library cooperative efforts. The aim of the Act, as had been the aim of Sibley for Harvard, and the Farmington Plan for the country as a whole, was to direct the Library of Congress to acquire "so far as possible all library materials currently published throughout the world which are of value to scholarship; and (2) providing catalog information for these materials promptly after receipt and distributing bibliographic information by printing cards and other means." (Vosper, p.96, Hamlin, 1981, p.195) The "other means" surely encompassed cooperative efforts subsequently initiated through such bibliographic utilities as the Ohio College Library Center, now OCLC, Inc., and the Research Libraries Group, Inc., whose tenth anniversary we are celebrating this week.

One of the facets of collection building in the post-World War II period has unquestionably been the involvement of the federal government. As David Weber has noted in his excellent review of "A Century of Cooperative Programs Among Academic Libraries," (Weber, 1976) the U.S. government has long been involved in cooperative enterprises with research libraries from the establishment of the National Union Catalog and the s[illegible]ing of printed cards at the Library of Congress at the turn of the century, through federal relief during the Great Depression, the Cooperative Acquisitions Project for Wartime Publications (1946), the Public Law 480 which provided funds for acquisition and cataloging of multiple copies of publications from eight countries (1961), the Higher Education Act of 1963, the Medical Library Assistance Act (1965), and, more recently, the new Title II-C of the Higher Education Act which provides for a series of grants for strengthening library research resources in the national interest. There are also subsidiary benefits which ought not to be overlooked, e.g. the provision of student aid, especially under the College Work/Study Program and the provision of overhead funds from research contracts which provide some university libraries with significant funds for acquisitions.

Charles Osb~~o~~urn has noted that the federal government's support of research has also greatly influenced the kind of research undertaken and the methodology used by researchers (Osb~~o~~urn, 1979).

The Farmington Plan was only one of a variety of cooperative enterprises. Any listing should surely include deposit libraries like the Center for Research Libraries which expanded its activities to include acquisitions; the United States Book Exchange (USBE); the foreign Newspaper Microfilm Project, the Latin American Cooperative Acquisitions Program (LACAP), the Center for Chinese Research Materials, and new networks and consortia. All of these activities were aimed at providing American researchers with more materials for their study and research.

At this point I should like to turn our attention to the specific efforts of individual libraries to amass large bodies of research materials. In the various cooperative enterprises mentioned above, sometimes only the largest university libraries cooperated. In others the "emerging university libraries" played a role. The provision of adequate library resources on campus was an early concern in California. The Berkeley librarian, concerned with meeting library needs posed by burgeoning enrollments, titled his 1958 C & RL article, "Where Did You Go? To the Library. What Did you Get? Nothing." (Coney, 1958) Well, by the mid-sixties, not quite "nothing". Books for College Libraries, a basic buying list for the new university libraries in the University of California system, became a national purchasing list for emerging university libraries in other states. To keep up with the demand other states made substantial appropriations to enable their universities, which lacked significant library resources, to compete with older and more distinguished universities. In the enthusiasm of the sixties many expected higher education to save the world.

There were massive purchases of books ("en bloc" was the phrase), whole libraries shifting to the North American continent from Europe and elsewhere.

The American higher education tradition of entrepreneurship led to fierce competition for the largest, the most prestigious, and the most comprehensive collections. Private donors and wealthy alumni vied with the state and federal governments in providing funds for acquiring collections. The exploits of the redoubtable President Harry Ransom at the University of Texas were the despair and envy of other university presidents but Ransom's efforts were successful. No researcher could study George Bernard Shaw and many other twentieth century authors without recourse to the manuscripts in Austin. Prince Harry had his imitators elsewhere. New and old universities not only bought large private collections but also entire bookstores. In the U.S.A., Kent State University bought Gilman's, Penn State the Aberdeen Book Company, and UCLA Bamberger and Wahrman in Jerusalem. The University of British Columbia absorbed 36 tons of Norman Colbeck's private stock. Not to be ignored were the rapid expansion of libraries at universities as diverse as Brigham Young University and the Universities of Alberta and Toronto in Canada. What a heady, exhilarating time it was for North American librarians!

To cope with the demands for materials and the greater funds available to secure library resources on a worldwide basis, librarians adopted new techniques including approval plans, blanket order plans, and sending bibliographers abroad to purchase items on site from individuals and book dealers. Blanket orders and approval plans have become so popular that a number of conferences have been held to discuss their problems and potential. Edelman, in an interesting paper on the methodology of collection development, provides a model of how decisions are made both in the macro and micro environment. (Edelman, 1979).

In their zeal for building collections of material from hitherto neglected areas, American librarians roamed the globe with American Express travelers' checks or letters of credit so they could conclude purchases on the spot. Their journeys took them from Capetown to Cairo, form Tehran to Tokyo, and from

Carac~~p~~as to Santiago.

If the acquisitions were great, so were the problems in processing the materials and making them accessible. By 1970 the University of Texas at Austin reportedly had over a million volumes uncataloged, a mass of inaccessible material rivaled only by the Library of Congress when Herbert Putnam became Librarian in 1899. Whether from traditional methods of acquisition title-by-title by faculty selection or from the newer approaches of subject and area bibliographers on the library's staff, order and catalog departments had difficulty coping. The promise of automation, seemingly long delayed, was the hope of the future--a future which arrived in the seventies largely through the creative work of people like Fred Kilgour and Henriette Avran. NPAC provided relief but the cooperative efforts through the bibliographic utilities were essential.

If books and serials provided problems, the renewed attention to archives and manuscripts added others. Berkeley's Bancroft Manuscripts Division increased from 4.5 million papers to more than 35 million in the period from 1963 to 1984 (CU News, 1984). That is about the same number of pieces of paper held in the Lyndon B. Johnson Presidential Library at the University of Texas. These numbers dwarf my own university's respectable 9.5 million papers in the Southern Historical collection which has been in existence over fifty years.

The federal government, under a variety of programs but chiefly from grants made by the Research Division of the National Endowment for the Humanities, has provided some assistance in developing tools to describe these collections.

As funds for acquisitions stabilized in the seventies and inflation took its heavy toll, questions began to be asked about the lack of focus in university programs, faculty strength, and library acquisitions. The emergence of bibliographers, who assumed what had once been a major faculty responsibility, led to collection development policies, identification areas of collection strength, and finally to a concern with collection evaluation. Atempts were and are being made to address the problems of focus through "collection management." Expressed concretely, the question becomes "How can we secure the maximum access for scholars and researchers for the least cost?" That emendation of Melvil Dewey's famous phrase has always been a concern of the research librarian but has come back with increasing force as we struggle to collect worldwide with stable budgets.

In a major work in 1979, Charles Osburn questioned whether there had been a correspondence between collection development and the changing patterns of research as practiced in American Universities during the past twenty years. (Osburn 1979). Noting that research in all fields has become attuned to the objective, the quantitative, societal needs, and governmental funding, he, too, raises the question of size and focus. Osburn recognizes that the fifties and sixties saw such impressive growth that at least fifty and perhaps even 100 university libraries now have very fine resources for traditional research. He points to vast microform libraries which puts much of the retrospective material within reach of most scholars- and that at relatively low cost.

Osburn also pointed out that librarians have made little use of available research on behavior patterns of researchers and suggests more attention to collection analysis with emphasis on current demand.

Much has happened since Osburn wrote his book. Strategic planning is underway in many places. Bibliographic activities have increased. The ARL's Collection Analysis Project and RLG's conspectus have provided means for better assessment of collections. The Council on Library Resources has funded conferences to bring together university administrators and librarians to address the problem of supporting scholarly research both in traditional ways and new ways via the computer.

As W. J. Haas reminded his audience at Yale in 1980, supporting research through computerized search services, in a world where even then there were over 500 data bases, will require new capital investments. But he expressed the long-term objectives of research universities and their libraries in terms that are not so far removed from our history. "Like research universities, research libraries are a public good, and it is their obligation to extend access to recorded knowledge, at acceptable costs and without constraint." (Haas, 1981, p. 156).

As we look to the uncertain future of this attempt to acquire information worldwide, I recall the observation of my colleague David Dill about the basic entreprenuerial thrust of American higher education. In the competition of universities to advance the "Commonwealth of Learning," to use Elizabeth Eisenstein's happy phrase, I believe that ways will be found to support both the traditional and added functions of their libraries. Institutional pride and prestige will doubtless assure the needed resources.

What about traditional approaches?

Probably most librarians share the hope expressed in Scholarly Communication; The Report of the National ~~I~~Enquiry (1979) that somehow some way will be found to enable libraries to purchase more university press books and journals. That pious hope is one the author of this paper, as chair of the UNC Press Finance Committee, shares. **Of the major recommendatinns, a collaborative national bibliographic system seems the most likely. A national periodicals center is clearly dead (Biggs, 1984) and the idea of a national library agency never received serious attention.**

Richard De Gennaro, perceptive commentator on the American research library scene, reminds us that large research libraries are society's bank from which scholars, at least for the next two decades, will continue to draw their research strength (De Gennaro, 1982). They will surely not be the only banks but they will continue to be very important ones. And they are still growing.

The gross number of volumes added by all ARL libraries in 1982-83 was almost 9 million volumes. The total holdings of all ARL members has now reached 300 million volumes. If our efforts since 1945 have been massive (and they have) and if we can take satisfaction with their results (which we can), we also know that we cannot continue in individual libraries to acquire the world's literature on the comprehensive scale of the last forty years, nor if Charles Osburn is right, do we need to do so.

As a library historian, I am conscious of how remarkably perceptive many librarians have been. When Harvard published its little booklet in 1969 on the future of the Harvard University Libraries, scoffers could hardly believe the projections that in 1976 Harvard's collections would pass 10 million volumes and its annual budget would be $14.5 million (Bryant, 1969). Yet Harvard came very close to both projections (9.4 million volumes, expenditures of $12.7 million, staff of 874 persons).

We tend to be too pesimistic about the future. When I entered this profession in 1949, librarians were saying no one would ever build another large library like Princeton's Firestone Library because no one else could afford the $6.5 million. How strange that prediction sounds today; but I hear others say that my own University's Davis Library will be the last large university library ever built.

I have no doubt, in the years immediately ahead, that we shall address the problems of worldwide collection building and access to these massive collections and new information resources in the creative ways which collaborative agencies like RLG are developing. For I do not believe the research Community permit us to do anything else.

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Holley
Appendix 1

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TABLE 1

Library Holdings (in Thousands of Volumes) of and Ph.D. Degrees Awarded by Major American Public and Private Universities, 1876-1975.

State Institution (Year founded)	1876		1900		1910		1920		1930		1940		1950		1961		1971		1975	
	Vols.	PhD	Vols.	PhD	Vols.	PhD	Vols.	PhD	Vols.	PhD	Vols.	PhD	Vols.	PhD	Vols.	PhD	Vols.	PhD	Vols.	PhD
Alabama																				
Auburn ...... (1856)	3		13		23				47		31		150		298	16		92	733	
Alabama ..... (1831)	6		25		30		34		75		250		357		694	29	748	236	1051	83
Alaska																				
Alaska .... (1915)									11				32		59	4	304	12	358	
Arizona																				
Arizona State . (1885)									14		28		105		412	3		151	955	121
Arizona ...... (1885)			3		15		52		85		138	2	230	2	343	28		245	1723	219
Arkansas																				
Arkansas ..... (1871)	1		15		14		35		98		161		271		459	29	684	115	752	
California																				
Cal. Inst. Tech. (1891)			3				9	1	25	18	53	30	75	70	129	73	238	117	293	
Southern Cal. . (1879)					15		40		127	8	274	33	566	101	963	139	1452	468	1670	328
Stanford ...... (1885)			65	2	174	5	320	6	530	41	773	42	1092	166	1691	219	3584	580	4092	515
U. C. Berkeley . (1868)	14		99	2	248	6	479	23	756	83	1081	122	1665	244	2596	369	4009	798	4649	747
Davis ...... (1908)									23		54		66		208	38	909	179	1234	225
Los Angeles . (1887)									138		347		762	79	1568	159	3038	572	3519	487
Riverside ... (1907)									5		10		14		150		643	109		
San Diego .. (1912)											17		24		45		813	128	1102	167
Santa Barbara (1891)							4		15		36		51		149		844	36	1126	130
Colorado																				
Colorado State . (1870)			11		40		32		64		96		142		210	6	768	129	935	143
Colorado ..... (1861)			26		52		122		221	2	307	13	706	37	722	78	1401	249	1793	263
Denver .... (1864)					12				58		94		263	9	375	40	565	94	802	
Connecticut																				
Connecticut ... (1881)					11		16		23		251		132		423	34	808	157	1400	193
Yale .... (1701)	100		309	26	575	27	1250	28	1983	83	2219	113	3979	174	4478	238	5829	338	6618	348
Delaware																				
Delaware ..... (1743)	7		14		17		27		41		78		150		328	16	766		949	
District of Columbia																				
Catholic ...... (1887)			31		40	3	123	5	300	23	286	43	403	81	594	85	854	210	968	
George Washington . (1821)	5		15						86		109	1	240	12	352		541	76	667	
Georgetown ... (1789)	34		79	2	108		140		140	4	259	9	203	35	470	26	669	60	867	85
Howard ...... (1867)	10		14		26		38		54		128		267		376		637		837	34
Florida																				
Florida State .. (1857)					3		12		36		83		231		568	64	916	218	1126	336
Florida .... (1853)					12		35		92		109	1	407	20	917	102	1487	273	1736	292
Miami .... (1925)											27		232		585		953	56	1072	
Georgia																				
Atlanta ...... (1865)	4		11		12		15		18		65		105		249			2		
Emory .... (1836)	9		20		30		50		115		173		332		710	24	966	76	1150	69
Georgia ...... (1785)	19		30		36		66		66		146	2	254	1	458	4	1158	255	1522	282
Hawaii																				
Hawaii .... (1907)							21		50		111		227		348	7	1130	89	1379	
Idaho																				
Idaho .... (1889)			4		22		44		91		93		129		213		727	57	828	
Illinois																				
Chicago ...... (1891)			303	43	500	45	500	65	915	186	1300	163	1797	295	2142	209	3090	418	3622	439
Illinois .... (1867)	11		47		157	12	461	29	836	70	1217	130	2383	226	3383	409	4609	824	5509	747
Northern Illinois (1895)			12		12		25		32		50		74		156		604	30	749	
Northwestern .. (1851)	28		70		142		193		280	23	637	58	1013	109	1481	140	2364	276	2474	369
Southern Illinois (1874)	2		15		20		35		31		48		124		517		1403	166	1847	172
Indiana																				
Indiana ...... (1820)	7		35		77		134	6	218	19	343	11	796	68	1414	170	2341	380	3591	588
Notre Dame .. (1842)	20		32		60		103	1	143	4	195	12	263	21	550	33	1093	147	1220	145
Purdue ...... (1865)	1		13		29		53		110	4	154	28	286	138	535	230	964	474	1231	367
Iowa																				
Iowa State ... (1858)	5		14		31		77	2	180	27	297	53	413	101	518	151	831	314	1063	207
Iowa .... (1847)	7		60		80	4	162	11	366	33	473	86	633	151	1056	147	1584	388	1879	321
Kansas																				
Kansas State .. (1863)	2		21		36		68		96		125	2	160	11	255	33	600	115	716	
Kansas ...... (1863)	2		33		76	3	132	1	232	11	320	78	424	23	925	79	1568	261	1799	287
Kentucky																				
Kentucky ..... (1865)	13		18		23		41		116	2	280	7	497	17	925	35	1153	135	1426	151
Louisiana																				
Louisiana State (1860)	11		21		30		50		77		264	25	393	28	966	81	1348	205	1538	148
Tulane .... (1834)			25	1	47		82		141	1	242	2	342	11	743	22	1071	133	1217	81

State Institution (Year founded)	1876		1900		1910		1920		1930		1940		1950		· 1961		1971		1973	
	Vols.	PhD	Vols.	PhD	Vols.	PhD	Vols.	PhD	Vols.	PhD	Vols.	PhD	Vols.	PhD	Vols.	PhD	Vols.	PhD	Vols.	PhD
Maine																				
Maine .... (1865)	3		24		41		68		84		179		233		319		437	23	497	
Maryland																				
Johns Hopkins . (1876)	5		194	35	142	25	225	31	376	64	567	65	839	84	1185	85	2085	194	2044	[illegible]
Maryland ..... (1807)	1		3		10		8	1	66	3	142	18	239	36	458	91	1049	346	1465	336
Massachusetts																				
Amherst ...... (1821)	37		72		80		125		162		228		279		348		449		506	
Boston College (1863)	9		31						125	5	175	3	232		541		828	56	909	
Boston Univ. . (1839)	7		25	2	122	6	58		142	4	207	20	319	48	521	138	831	220	1127	266
Brandeis ...... (1948)													25		234	18	455	99	500	
Clark .... (1887)			18	8	55	14	95	11	126	12	162	6	200	27	233	19	282	26	338	
Harvard ...... (1636)	160	5	976	35	850	41	2028	49	2971	105	4139	153	5397	527	6848	344	8451	613	9206	477
U. Mass. Amherst ... (1863)	1		21		32		61		84	3	126	12		11	239		793	262	1362	337
MIT .... (1859)	3		64		86	4	140	5	280		385	64	450	126	745	213	1314	399	1573	312
Michigan																				
Michigan State (1855)	4		23		31		45		75	4	152	10	416	68	825	200	1759	733	2102	603
Michigan ..... (1817)	30		160	4	270	9	432	14	784	81	1098	141	1415	194	2912	351	4200	784	4668	722
Wayne State .. (1868)			11		13				50		168		379		754	52	1367	208	1610	220
Minnesota																				
Minnesota .... (1851)	13		60	3	145		300	1	654	67	1088	113	1528	154	2020	218	3112	615	3359	338
Mississippi																				
Mississippi .... (1844)	7		17		26		31		50		77		151		336	2	464	68	319	
Missouri																				
Missouri ...... (1839)	13		36		110	2	223	2	410	14	395	24	605	65	1043	90	1589	158	1793	227
St. Louis ..... (1818)	22		50		60	17	73		140	5	374	8	437	24	481	47	710	151		
Washington U. (1853)	2		5	3	109		176	3	295	10	409	4	527	45	821	37	1421	154	1545	162
Montana																				
Montana ..... (1893)			7		16		46		183		212		303				561	32	676	
Nebraska																				
Nebraska ..... (1869)	2		53		90	1	147	3	256	11	353		471		600	77	976	223	1208	205
Nevada																				
Nevada ...... (1864)			13		17		35		50		63		90		164		413	23	512	
New Hampshire																				
Dartmouth ... (1769)	48		105		120		150		250	1	512		666		829		1030	21	1172	31
New Hampshire (1866)			6		26		40		66		106		170		295	9	560	29	698	
New Jersey																				
Princeton ..... (1746)	46		144	3	270	9	444		643	31	959	43	1166	80	1689	140	2314	255	2715	231
Rutgers ...... (1766)	11		46		61		108	1	239	5	342	12	573	49	961	81	1164	182	1339	238
New Mexico																				
New Mexico .. (1889)			4		8		13		34		80		184	5	326	23	720	129	880	
New York																				
City College .. (1847)	19		33		39		71		100		245		370		522			112	863	
Columbia .... (1754)	17		345	21	448	44	747	69	1222	184	1715	198	1897	456	2939	329	4241	505	4661	521
Cornell ...... (1865)	39		268	19	383	35	630	45	810	129	844	131	1463	210	2198	239	3779	508	4272	460
Fordham ..... (1841)					50		100	7	110	54	198	23	200	43	401	77	927	94		
NYU .... (1831)	4		54	7	100	10	153	6	319	48	592	125	888	179	1121	307	2111	567	2456	455
SUNY																				
Albany .... (1844)							2		15		30		46		65		611	50	1007	110
Buffalo ...... (1846)							29		62		161		195		374	29	1575	243	1523	241
Stony Brook . (1957)															35		586	55	936	98
Syracuse ..... (1870)	9		64		78	1	109	2	195	2	322	3	348	36	559	94	1548	231	1541	216
Rochester .... (1850)	12		40		52		83		190	2	380	25	514	36	721	61	1179	198	1402	200
North Carolina																				
Duke .... (1838)	12		16		40				192	8	600	23	994	46	1493	82	2231	220	2622	153
N. C. State ... (1891)			4		8		10		30		55		108		228	48	530	203	692	
North Carolina (1789)	17		43		58		93		223	27	386	34	557	100	1077	96	1819	245	2125	332
North Dakota																				
North Dakota . (1883)			10		35		58		98		89	2	165	2	226	10		85	341	
Ohio																				
Case Western Reserve .... (1826)	11		36		90		138		350	5	554	25	644	33	758	51	1175	326	1558	227
Cincinnati .... (1819)	1		32		118	1	125	2	256	14	491	27	649	20	813	5	1150		1553	147
Kent State .... (1910)											76		106		204		648	48	1066	[illegible]
Oberlin ...... (1832)	15		59		98		204		323		404		486		552		605			
Ohio State .... (1870)	1		45		95		215		359	68	552	97	803	229	1447	260	2539	676	3033	[illegible]
Ohio Univ. ... (1804)	6		17		30		52	2	75		127		197		312	5	460	108	652	
Oklahoma																				
Oklahoma State (1890)					14		25		58		139	5	275	15	619	53	1006	217	1141	213
Oklahoma .... (1890)			8		16		32		130		217		333	15	782	49	1158	220	1285	[illegible]
Oregon																				
Oregon State .. (1868)			3		8		41		93		172	4	252	20	396	52	643	208	736	
Oregon ...... (1872)			11		30		94		233	2	307	2	451	12	822	49	1104	349	1266	[illegible]
Pennsylvania																				
Lehigh .... (1865)	2		115		125		100		190		245		310	19	391	25	540	109	612	

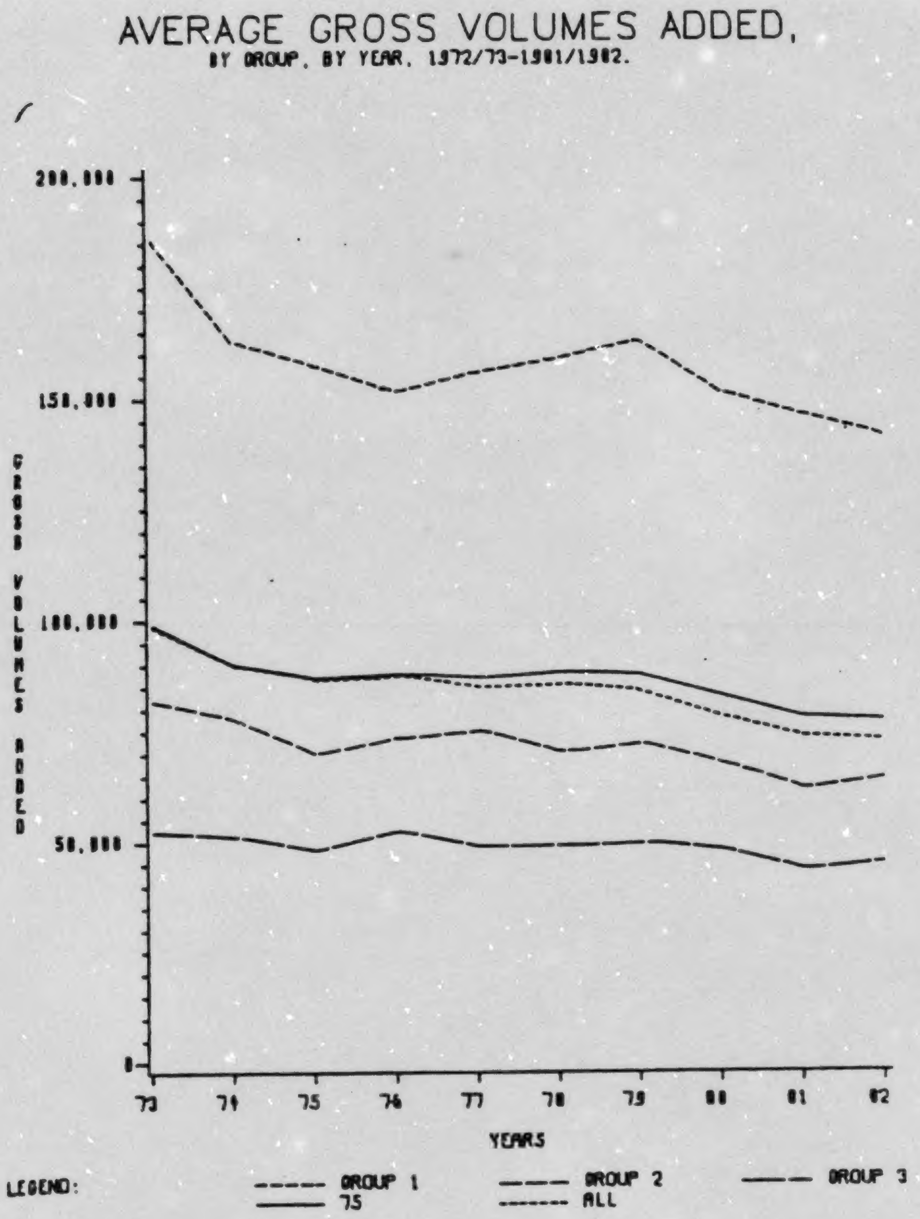
		1876		1900		1910		1920		1930		1940		1950		1961		1971		1975	
State *Institution*	(Year founded)	Vols.	PhD	Vols.	PhD	Vols.	PhD	Vols.	PhD	Vols.	PhD	Vols.	PhD	Vols.	PhD	Vols.	PhD	Vols.	PhD	Vols.	PhD
Penn. State ...	(1855)	3		16		40		75		120	3	207	40	323	69	620	175	1165	601	1825	340
Pennsylvania ..	(1740)	20	7	260	15	293	35	503	21	712	90	934	71	1194	124	1703	157	2329	362	2640	326
Pittsburgh	(1787)	3		15		15	2	24	3	145	22	191	43	578	80	977	112	1456	357	1972	412
Temple	(1884)					8		9		41		149	8	322	14	527	34	1029	147	1247	102
Puerto Rico																					
Puerto Rico ...	(1900)							8		25		73		123		538		879			
Rhode Island																					
Brown	(1764)	46		135	3	186	5	270	3	403	11	573	19	735	35	1059		1390	156	1536	145
Rhode Island .	(1892)					17		22		25		60		105		194	3	437	45	584	
South Carolina																					
South Carolina	(1801)	30	2			43		65		110		156		212		496	7	934	80	1372	106
South Dakota																					
South Dakota .	(1881)			8		16		38		70		103		135		182	2	308	40	379	
Tennessee																					
Tennessee	(1794)	4		16		29		41		112		169		276	12	670	37	1122	262	1229	253
Vanderbilt	(1872)	7		30	1	45	2	80	2	150		374	9	567	36	809		1301	189	1301	207
Texas																					
Houston	(1934)											14		72		231	9	664	120	1192	192
Rice	(1891)									81	3	151	6	206	12	392	26	660	115	875	88
Southern Methodist ..	(1910)									83		112		283		531			49	955	
Texas Tech ...	(1923)									16		70		100		471	9		102	946	
Texas	(1887)			45		72		194		422	19	639	46	934	86	1424	154	2427	438	3726	454
Texas A & M .	(1876)			9										175		401		716	215	926	234
Utah																					
Brigham Young	(1875)									67		117		169		330			78	1267	58
Utah	(1850)			30		31		62		102		149		250		438	55	1178	242	1520	245
Vermont																					
Vermont	(1791)	20		89		80		105		128		152		200		220		579	24	563	
Virginia																					
Virginia	(1819)	40		50	2	70	4	120	4	172	16	338	26	592	36	1111	41	1699	223	2006	172
Virginia Polytech. ...	(1872)	1		4		12		30		61				135		289		626	154	877	
Washington																					
Washington State	(1890)			7		23		74		200	2	406	2	600	17	750	41	853	142	1010	162
Washington ...	(1861)			24		41		120	2	258	13	356	33	700	38	1104	113	1876	154	2187	386
West Virginia																					
West Virginia .	(1867)	4		17									4	232	3	461	5	684	101	814	
Wisconsin																					
Marquette	(1857)			10		18		30		53	2	93	4	172		310			38	536	
Wisconsin Madison ..	(1836)	8		81	5	151	18	276	34	422	130	485	160	777	298	1455	397	2417	913	2973	819
Milwaukee ..	(1908)					28		30		41		50		78		149		663	16	938	
Wyoming																					
Wyoming	(1886)			14		28		46		75		104		154		284	7	465	89		

Source: Figures in these tables were drawn from a variety of sources. They are, of course, based on differing counting techniques and are not necessarily compatible at all times. In cases of extreme variations we have omitted the information. The main sources on library collections were: *Annual Report of the Commissioner of Education* for 1876, 1900, and 1910; the *Biennial Survey of Education* for 1918–20, 1928–30 and 1938–40; the *Library Statistics of Colleges and Universities: Institutional Data* for 1960-61 and 1970–71; and the Preliminary Report (December 1975) of the *Survey of College and University Libraries* of the National Center for Education Statistics. Additional data were retrieved from *Public Libraries in the United States of America* (1876), *College and University Library Statistics* 1919–20—1961 (Princeton University Library); the *Academic Library Statistics* 1970–71 and the *ARL Statistics* 1974–75, both issued by the Association of Research Libraries, as well as editions of the *American Library Directory*. Opening dates of universities are quoted from *Webster's New Collegiate Dictionary* (1974). Information on the number of Ph.D. degrees come from the above quoted *Annual Reports* and *Biennial Surveys*; M. Irwin, *American Universities and Colleges*, 6th ed. (1952); *Index to American Doctoral Dissertations* 1960-61 and 1970–71 as well as from *ARL Statistics* 1974–75, accounting for the incomplete data for 1975.

FROM: Hendrik Edelman and G. Marvin Tatum, Jr., "The Development of Collections in American University Libraries," College and Research Libraries, 37: 238-242, May 1976.

MOLYNEUX TABLES

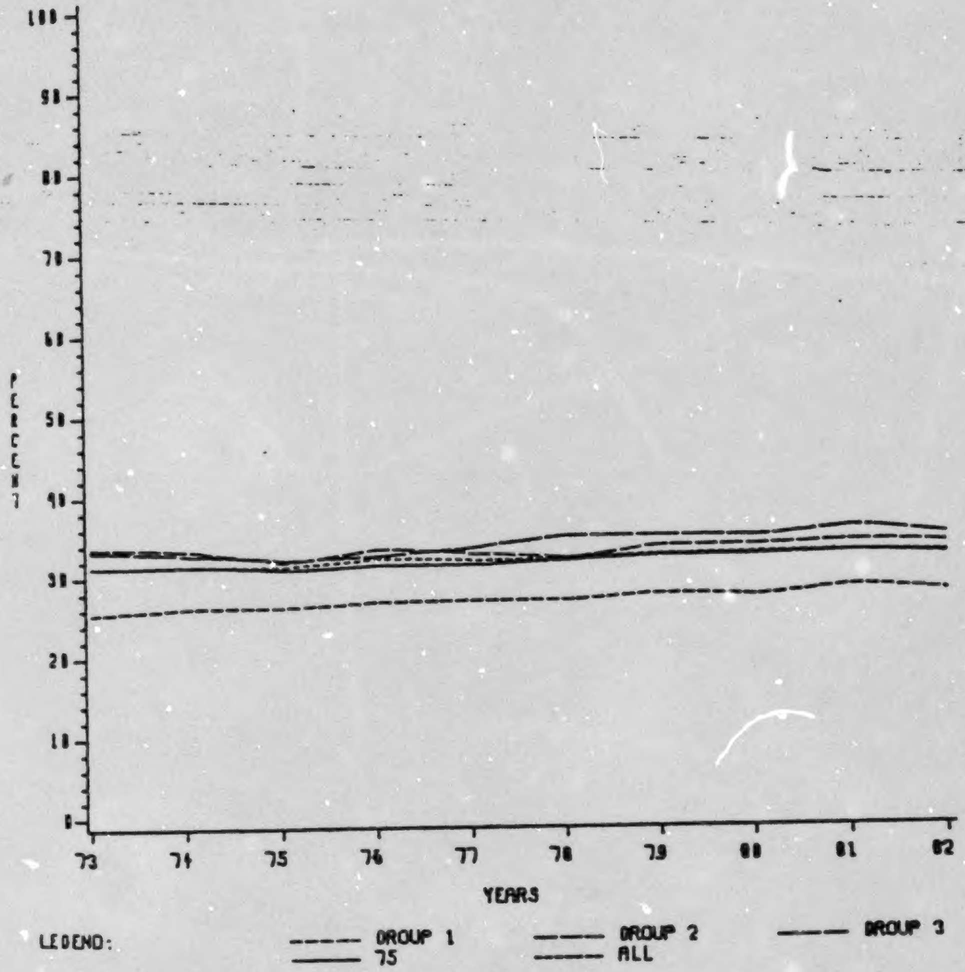
The following are selected tables from Robert Molyneux's dissertation on the growth rates of three clusters of fifteen libraries as revealed by the ARL statistics during the decade from 1972-73 to 1981-82. For more detailed information the reader should consult the dissertation.



See Table 2-4A/D

Figure 5

RATIO OF MATERIALS EXPENDITURES TO TOTAL EXPENDITURES,
BY GROUP, BY YEAR, 1972/73-1981/1982.



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See Table 2-14A/D

Figure 21

TABLE 2-3A

INCREASES IN VOLUME COUNT FOR GROUP I LIBRARIES, 1972/73-1981/82

	YEAR										BY INSTITUTION		
INSTITUTION	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	SUM	MEAN	(STD)
Harvard	*	168,907	178,285	176,585	164,321	205,638	160,778	168,671	177,908	148,657	1,549,750	172,194	(15,720)
Yale	*	175,656	168,024	173,784	191,972	187,741	173,850	155,758	177,168	146,303	1,550,256	172,251	(14,286)
Illinois	*	168,965	181,551	160,490	158,564	-206,042	136,728	177,157	154,302	151,490	1,083,205	120,356	(123,151)
Cal.,Berkeley	*	186,987	144,332	136,062	131,735	118,423	561,401	156,577	174,042	189,651	1,799,210	199,912	(137,817)
Michigan	*	104,775	119,661	122,617	126,576	132,120	86,451	98,428	111,538	135,254	1,037,420	115,269	(16,289)
Columbia	*	43,463	89,237	-38,569	107,148	102,199	91,778	91,991	96,099	79,889	663,235	73,693	(45,952)
Stanford	*	130,749	110,353	83,614	187,617	124,110	90,124	116,942	118,624	76,055	1,038,188	115,354	(33,095)
Cal.,Los Angeles	*	111,219	124,246	113,407	275,222	85,170	115,923	125,689	111,691	535,638	1,598,205	177,578	(165,121)
Texas	*	187,819	207,444	152,401	175,180	170,386	182,092	141,315	154,614	144,642	1,515,893	168,433	(22,031)
Chicago	*	150,988	137,145	139,819	124,026	133,340	163,468	127,886	130,488	124,279	1,231,439	136,827	(13,100)
Cornell	*	115,466	114,953	93,992	-387,370	115,653	111,912	9,769	101,668	83,077	359,120	39,902	(163,684)
Wisconsin	*	130,192	188,567	159,563	105,289	113,748	123,284	156,485	412,467	139,902	1,529,497	169,944	(94,506)
Washington	*	84,095	85,887	85,739	963,288	156,892	394,952	88,450	147,020	60,483	2,066,806	229,645	(293,426)
Indiana	*	133,047	226,303	329,599	178,042	205,375	425,139	-1,270,331	96,918	137,269	461,361	51,262	(506,273)
Minnesota	*	118,495	80,372	103,228	-299,163	259,885	79,138	104,971	63,142	74,685	584,753	64,973	(148,765)
BY YEAR											FOR ALL INSTITUTIONS, 1972/73-1981/82		
SUM	*	2,010,823	2,156,360	1,992,331	2,202,447	1,904,638	2,897,018	449,758	2,227,689	2,227,274	18,068,338		
MEAN	*	134,055	143,757	132,822	146,830	126,976	193,135	29,984	148,513	148,485		133,840	
(STD)	*	(40,390)	(45,808)	(76,118)	(290,043)	(130,574)	(146,013)	(362,160)	(80,585)	(113,387)			(174,762)

Mean values, by year, are plotted in FIGURE 4.

TABLE 2-3B

INCREASES IN VOLUME COUNT FOR GROUP 2 LIBRARIES, 1972/73-1981/82

	YEAR										BY INSTITUTION		
INSTITUTION	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	SUM	MEAN	(STD)
Kansas	*	61,448	54,192	-181,641	344,233	33,351	83,544	69,017	66,373	37,093	567,610	63,068	(132,779)
South. Calif.	*	42,567	51,982	54,473	67,325	73,379	91,692	77,717	69,819	65,385	594,339	66,038	(14,778)
Georgia	*	108,355	87,135	96,422	100,074	92,057	82,662	91,749	76,853	79,118	814,425	90,492	(10,235)
SUNY-Buffalo	*	108,200	40,940	77,677	71,939	137,235	74,245	51,494	66,653	134,851	763,234	84,084	(34,446)
Missouri	*	48,820	44,715	42,562	45,936	46,838	55,400	32,015	52,141	48,368	416,795	46,311	(6,600)
Rutgers	*	81,859	102,916	87,127	68,257	87,692	83,230	50,643	73,170	-265,798	369,096	41,011	(115,969)
Utah	*	3,226	72,204	92,567	104,863	92,998	110,007	68,722	0	25,662	570,249	63,361	(42,995)
Syracuse	*	37,900	36,748	43,359	93,239	74,051	69,574	66,285	64,282	57,415	542,853	60,317	(18,586)
Louisiana State	*	50,593	55,761	65,035	56,267	48,785	52,362	61,930	62,030	67,589	520,352	57,817	(6,637)
Colorado	*	105,006	-16,099	-137,398	61,124	44,262	50,250	41,023	35,303	39,492	222,963	24,774	(68,327)
Wayne State	*	69,418	61,037	52,306	41,551	50,713	49,371	34,497	39,260	25,518	423,671	47,075	(13,484)
Oklahoma	*	39,184	42,489	52,853	20,707	327,448	44,156	77,163	50,382	45,338	699,720	77,747	(94,791)
Washington-St.L.	*	57,436	48,617	74,372	45,479	43,684	46,222	43,531	40,109	44,917	444,367	49,374	(10,534)
Rochester	*	57,244	50,285	198,000	53,000	-88,000	82,000	53,000	45,000	126,675	577,204	64,134	(75,951)
Massachusetts	*	88,455	73,574	90,345	79,536	54,803	67,274	75,945	72,775	66,402	669,109	74,345	(11,083)
BY YEAR											FOR ALL INSTITUTIONS, 1972/73-1981/82		
SUM	*	959,711	806,496	708,059	1,253,530	1,119,296	1,041,989	894,731	814,150	598,025	8,195,987		
MEAN	*	63,981	53,766	47,204	83,569	74,620	69,466	59,649	54,277	39,868		60,711	
(STD)	*	(29,886)	(26,598)	(92,294)	(75,679)	(84,974)	(19,509)	(17,613)	(20,263)	(90,437)			(59,571)

Mean values, by year, are plotted in FIGURE 4.

TABLE 2-3B

TABLE 2-3C

INCREASES IN VOLUME COUNT FOR GROUP 3 LIBRARIES, 1972/73-1981/82

	YEAR										BY INSTITUTION		
INSTITUTION	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	SUM	MEAN	(STD)
Cal., Santa Barb.	*	70,522	49,724	61,385	47,533	39,853	49,752	50,164	41,440	56,641	467,014	51,890	(9,651)
Alabama	*	31,889	37,746	37,299	43,090	38,771	48,729	-95,292	46,842	302,491	491,565	54,618	(103,377)
Iowa State	*	62,543	55,330	57,799	59,179	67,871	47,252	53,835	51,611	45,830	501,250	55,694	(7,076)
Tulane	*	28,179	25,518	27,997	28,487	34,574	34,153	29,527	26,940	28,021	263,396	29,266	(3,093)
Tennessee	*	48,551	55,537	50,965	52,396	57,757	45,652	-79,824	35,640	29,333	296,007	32,890	(43,260)
Florida State	*	66,643	42,339	41,895	43,904	54,384	72,443	54,455	-22,417	42,874	396,520	44,058	(27,291)
Case West.Res.	*	33,465	2,241	11,759	21,492	21,506	-266,963	21,902	23,951	18,352	-112,295	-12,477	(95,816)
Texas A&M	*	43,864	68,078	100,576	80,531	60,595	72,245	58,815	58,576	45,293	588,573	65,397	(17,683)
Boston	*	65,743	44,987	53,053	43,588	41,397	22,252	27,124	32,601	48,621	379,366	42,152	(13,421)
Georgetown	*	46,978	52,806	35,578	179,554	45,392	64,739	53,262	38,731	59,625	576,665	64,074	(44,294)
Cincinnati	*	8,879	21,772	-369,173	44,966	47,290	-59,592	37,061	24,251	52,201	-192,345	-21,372	(134,734)
Oklahoma State	*	30,480	19,358	17,863	26,947	24,578	20,396	22,250	24,777	29,903	216,552	24,061	(4,496)
Washington State	*	39,584	39,249	50,753	31,135	51,189	46,611	41,825	34,255	38,521	373,122	41,458	(6,921)
Howard	*	47,580	31,566	50,338	64,826	60,274	46,021	57,882	43,015	83,142	484,644	53,849	(14,845)
Rice	*	103,000	35,085	41,555	36,805	-72,652	20,368	132,653	37,208	37,983	372,005	41,334	(56,637)
BY YEAR											TOTALS FOR ALL INSTITUTIONS, 1972/73-1981/82		
SUM	*	727,900	581,336	269,642	804,433	572,779	264,058	465,639	497,421	918,831	5,102,039		
MEAN	*	48,527	38,756	17,976	53,629	38,185	17,604	31,043	33,161	61,255		37,792	
(STD)	*	(22,666)	(16,956)	(109,077)	(38,100)	(33,376)	(84,844)	(54,984)	(18,432)	(68,544)			(58,214)

Mean values, by year, are plotted in FIGURE 4.

TABLE 2–3D

INCREASES IN VOLUME COUNT FOR "75" AND "ALL" LIBRARIES
1972/73-1981/82

	YEAR										FOR THE DECADE		
"75"	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	SUM	MEAN	(STD)
SUM	*	5,455,880	5,498,963	4,863,389	5,824,228	5,906,395	6,316,967	3,715,413	4,681,571	5,638,977	47,901,783		
MEAN	*	72,745	73,320	64,845	77,656	78,752	84,226	49,539	62,421	75,186		70,966	
(STD)	*	(56,188)	(56,890)	(100,991)	(144,831)	(69,850)	(95,679)	(167,154)	(71,508)	(81,198)			(100,579)
"ALL"													
SUM	*	5,455,880	5,613,186	5,551,352	6,461,899	6,513,755	6,914,892	3,926,527	5,292,970	6,370,632	52,103,093		
MEAN	*	72,745	72,924	66,884	75,138	75,741	80,406	44,620	59,472	70,785		68,557	
(STD)	*	(56,188)	(56,248)	(98,115)	(136,972)	(67,065)	(92,232)	(162,450)	(66,264)	(74,953)			(97,582)

Mean values, by year, are plotted in FIGURE 4.

Paper No. 9

THE RESEARCH LIBRARIES GROUP, INC.
INTERNATIONAL CONFERENCE ON RESEARCH LIBRARY COOPERATION

Conference Session III
October 2, 1984

"International Cooperation in Preservation"

by
John Jolliffe
Bodleian Library
Oxford

International co-operation in Preservation

There is at present a divergence in usage between Britain and North America over the term for the activity of maintaining the existence of the stocks of our libraries. In Britain the usual term has been "conservation" while in North America the preferred term has been "preservation".

It is worth starting by considering these two terms to see whether either can be held to embrace the meaning of the other and could thus become the usual term throughout the English-speaking world. Certainly, over the past few years, the word "preservation" has increasingly come into use in Britain. Although at the outset we might put on one side the term "conservation" which in the USA bears the connotation of whooping cranes and the discharge of industrial effluent into rivers and which in the UK bears similar connotations, providing powerful emotional fuel for opposition to building freeways over the habitats of butterflies, nevertheless something of the "magical" and emotional properties of the word does attach to activities concerning the repair, restoration and physical preservation of artefacts in book form.

The cult of the object is not confined to a few religious bodies, though it flourishes there; some, perhaps many, of our rare book librarians, are drawn by "provenance" and "association" into textually needless collecting. A prominent British librarian from one of the few university libraries which has an attested existence before the foundation of the Bodleian has risked the wrath of rare book librarians and bibliographers alike by his view that we do not need to conserve "all the known copies of the third edition of Pamela". This is a question to which I will return later.

Preservation, as I understand it, centres on something rather different and somewhat broader: our obligation, as librarians, to carry forward to future generations the intellectual content of those artefacts. As an example of pure "preservation" can I remind you of the climax of Fahrenheit 451 where books, though being burned as a matter of state policy, are preserved in the memories of people, thus reverting to the preliterate period of Homer, when all transmission of "texts" was from one person's memory to another's. This medium of preservation is not, unfortunately, of "archival quality"!

Neither aspect is new to intellectual life or to library activity, in spite of the prominence into which they have come in recent years. Our medieval predecessors were "preservationists" when they copied out a text to a new manuscript before recycling the material of the old one: legibility and continuing availability of the text were their motives. They were "conservationists" when they provided sumptuous bindings, cases and boxes for books whose origins or associations were held to be particularly precious or sacred.

The two aspects can be opposed to each other: if in the Bodleian we were to make the display of the "Chanson de Roland" manuscript to visitors, dare one say for "worship", preclude or make difficult its consultation by scholars, we would plainly be giving lesser value to the purpose of "preservation". Such opposition of differing purposes is more usually seen in the antagonism of our conservators to the microfilming of particular volumes even though one of the objects of the microfilming operation is to provide a surrogate for the volume which will lead to less demand for consultation, handling and wear of the original. This case does however illustrate the possibility of the means of preservation assisting the cause of conservation: the converse is not in all cases true.

J.W. Jolliffe: Co-operation in preservation

Conservation is concerned with the arrest of deterioration, whether of the past or in the future, but, in my experience, does not seem to have settled firmly on the target of its operations: putting right the damage of the past still leaves open the question of whether one is aiming at returning the object to its pristine state or whether one is trying merely to correct some of the more obvious neglect of the past so as to leave the object as it would now be if that neglect had not taken place. Future deterioration may be limited by restrictions on access and greater care in use, and, of course, by a more conscious employment of materials which will be less liable to change.

Here again, the past can remind us that the conservation problems caused by the use of unsatisfactory materials in new or newly treated books are not novel. On 10th June 1602, Sir Thomas Bodley wrote to his first Librarian, Thomas James, presumably in answer to a report which James had made to him: "I hope those little wormes about the covers of your bookes, come by reason of their newnesse, and that heerafter they will away".

There is, though, a fundamental differance in aim between librarians and conservators which needs to be remembered: it is encapsulated, in my mind, by the frisson of horror which greeted a remark by our Keeper of Western Manuscripts to the effect that books are meant to be used, that is to say, in the long run to become worn, possibly even worn out with use.

The Library of Congress, with its two current projects, is hedging its bets: one project, the DEZ mass de-acidification experiment, is clearly concerned with conservation; the other, the optical disc pilot project, when applied to books, will be equally clearly concerned with preservation using a medium which will, it is hoped, have fewer conservation problems associated with it than film.

With either of these two meanings, is there a place for inter-library co-operation and in particular for international co-operation? In the case of conservation, there is clearly a possibility of continuing the tradition of dissemination of scientific knowledge and making available the results of surveys, tests and treatments so as to make known the full range of materials and procedures which conservators may need to apply in specific circumstances. This does not, it seems to me, to require any new initiative.

An extension of this idea whereby conservators could work in other institutions for periods would however be a useful adjunct to their training and would give them experience of and insight into the conservation problems of other countries, and indeed of other climates. This migration of conservators to work in each other's environment would also be a considerable reinforcement to the dissemination of knowledge by traditional means already referred to. David Stam, in his report for the British Library on his reactions to conservation effort in the United Kingdom, pointed out the relatively minor place which the "brittle book" problem has in the concerns of British librarians.

One possible area for co-operation in conservation would be the collective acquisition or operation of some process or equipment which would be too expensive for a single institution. The DEZ program might be a candidate: though it is worth remembering that for all the co-operating institutions, with the possible exception of the host, a collectively run facility would involve transport costs and problems of handling for an already fragile element of the book stock.

Another extension of this idea of collective ownership might be the employment of a flying squad of expert conservators to go to particular institutions to deal with special problems. This would fit most naturally with any disaster planning which were to be undertaken against the day when there might be another catastrophe of the kind which occurred with the floods in Florence.

Another area in which co-operation is possible and desirable is that of bringing pressure to bear on publishers to persuade them to use materials which have a longer life, and thus a lower running cost for libraries: acid-free paper is one obvious example, though there is also, we have discovered, a "sticky book" problem associated with some plastic bindings. There is, above all, the need to persuade them to abandon, where economically possible, the "perfect" binding. This is one area of activity where librarians need not play second fiddle to their conservators: the professional organisations and organs must be used in a concerted publicity campaign to reach the ears and minds of publishers and of public officials and representatives.

* * * * * * *

The most obvious area for co-operation, it seems to me, lies in preservation and in the co-operative provision of images of books, whether on film, optical disk or on some magnetic medium. Here there are not only advantages to particular institutions faced with preservation problems but to the whole world of academic libraries. It is not essential that a microform prepared for one library's preservation needs should only be made available in copy to other libraries with identical preservation requirements: an image once made can be made available to any institution or individual with an interest in acquiring a copy of the text.

Let us assume for the moment something which may prove not to be the case on a more careful examination: that overall, even including the costs of cataloguing, maintaining a database and accessing it, the cost of providing two copies of an image from a single original will prove to be cheaper than creating two images of separate originals. If this were so, then resources for image creation could be used more quickly to cover a large range of originals, thus satisfying immediate needs in a wide range of libraries, while at the same time extending access to the range of research materials. At this stage, I am sure, that my words will be falling on ears made deaf by previous rehearsal of these considerations. Already others have begun the task: the register of microform masters at NYPL, and the initiative of the British Library to set up a parallel and linked register for the UK are the first steps on the road; a database updatable to show intentions to "film" as well as achievements will be a necessary next step. This carries implications for standardization of cataloguing and will also imply the creation of a huge retrospective union catalogue.

It is plain to me that I shall be branded as a philistine by my colleagues, though I am no more willing than the next person to use a microfilm in preference to a book; so let me give some more tangible reason for suspicion. I have already mentioned the "third edition of Pamela" and it seems to me that there are clearly recognizable cases where neither consultation of the original nor the possibility of variation within "duplicates" is likely to require the continued preservation of an original. In these cases, and in the nineteenth century they are legion, it would seem to follow quite logically that the capture of the image could be followed without permanent deprivation of the world of scholarship by the destruction of the original. Even from earlier periods, an association copy which is marked only, say, by the signature of the interesting owner, but has no annotations which give an insight into the mind of that owner, needs no conservation beyond that page which indubitably demonstrates the ownership. We might thus have a single film preserved of the third edition of Pamela and a whole series of single leaves, mainly titlepages and flyleaves from other copies which give evidence for the interesting ownership: even this goes some way to the worship of relics and neglects the study of mankind or of man's mind.

It will be clear, by now, that I would declare myself a preservationist rather than a conservationist. It is clear also that there is no solution to the dilemmas which is both logically and emotionally acceptable. This does not change the problem of librarianship which is concerned with the reconciliation of opposed objectives. May I illustrate these conflicting opposites, together with the major preservationist purpose by one last quotation. The name of the rose, a recent best-selling, if not block-busting, novel centres on a library in a medieval monastery, whose abbot says, in the context of questions about access to the library and the nature of its contents, "a book is a fragile creature, it suffers the wear of time, it fears rodents, the elements, clumsy hands. If for a hundred and a hundred years everyone had been able freely to handle our codices, the majority of them would no longer exist. So the librarian protects them not only against mankind but also against nature, and devotes his life to this war with the forces of oblivion, the enemy of truth."

Paper No. 10

THE RESEARCH LIBRARIES GROUP, INC.
INTERNATIONAL CONFERENCE ON RESEARCH LIBRARY COOPERATION

Conference Session III
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"International Cooperation in Preservation of Library Materials"

by
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INTERNATIONAL CONFERENCE ON RESEARCH LIBRARY COOPERATION

International Cooperation in Preservation of Library Materials

by

William J. Welsh, The Deputy Librarian of Congress

Successful international cooperation in any area of endeavor has several prerequisites: (1) recognition of a shared problem or need, (2) knowledge of methods to solve the problem or at least ideas about how to develop solutions, (3) models for cooperation appropriate to the nature of the problem and its potential solutions, (4) commitment on the part of individuals and institutions in more than one country to communicate and work together toward the solution of the problem, (5) ability to act on that commitment, which requires both human and material resources and the support of policy-makers and funding sources.

This conference presents an appropriate opportunity for reviewing the progress which has been made in these areas toward international cooperation in the preservation of library materials, and to look ahead -- to ask how clearly we recognize the physical problems endangering our collections, what we know about how to solve them, how we might cooperate, whether we choose to work together, and what human and financial resources we are prepared to assign to the task.

For the past several years, my colleagues and I have been attempting to increase the awareness of the importance of preservation and to lay before U. S. librarians, publishers, and others involved in book production and the use of books some of the partial solutions the Library of Congress has for solving its preservation problems and the implications of such solutions. During this period I have also raised this subject with the Conference of Directors of National Libraries (CDNL) at annual meetings during the conferences of the International Federation of Library Associations and Institutions (IFLA). At the CDNL meeting in 1982, in Ottawa, I described the problem and how we are responding to the challenge at LC and suggested that individual countries take responsibility for preserving their own imprints which could lead us toward a Universal Preservation Program. At the meeting in Nairobi in August 1984, I invited the Directors to come to the Library of Congress in August 1985, prior to the IFLA meeting in Chicago, to see first hand what we are doing with mass deacidification and with optical disk technology. Such sharing of information is an important step toward the ultimate goal of preserving the world's library resources.

It is essential that we educate the right people to the dangers threatening those resources, and generate support at national levels for responding to that threat. Although the physical protection of collections has been an integral part of the library's responsibility throughout the centuries, the advent of wood pulp papers marked a dramatic reduction in the stability of the medium upon which so much of the world's information is recorded.

The crushing of fibers with the mortar and pestle to make pulp became highly automated with the introduction of continuous papermaking equipment, and in the case of better grade book papers, it became a chemical process. These advances in papermaking technology were made at the expense of paper permanence. Modern chemistry of pulp and paper production introduced the acids that cause paper deterioration. Acid-producing materials enter the paper in chlorine bleaching and, more seriously, with the introduction of sizing essential to modern printing presses. Modern papers use rosin that is precipitated with a chemical known as alum, which is the principal cause of acidic paper. The alum/rosin sizing is essential to modern printing in order to make fibers water resistant and prevent printing ink from feathering. The paper industry's reluctance to abandon this useful process, which helps meet the need for the ever-growing demand of inexpensive printing papers, needs to be understood in relation to the market demands on that industry. Less than 1 percent of the paper made in the United States is used for books.

The technology is available to manufacture permanent durable paper, but only a few paper companies have moved into production of modest amounts of what they call alkaline paper for printing purposes. The Council on Library Resources has played a leading role in stimulating the use of alkaline papers in printing. The American National Standards Institute has a committee which has drawn up standards for paper being used in library publications. It encourages publishers to indicate adherence to alkaline paper policy in the Cataloging in Publication (CIP) entry printed in the book and appearing on the MARC record, possibly associated with ISBN or ISSN. Such information will help us in controlling and selecting items needing preservation attention in the future. This will help but it will not solve U. S. preservation problems in this century.

At the present rate of acquisition the Library of Congress will accumulate in the next 50 years collections equivalent in number to those acquired in the first 180 years. The majority of the paper products among these acquisitions under present conditions will last no more than 25 to 100 years. Although our acquisitions program is international in scope, reflecting the scholarly and research needs of our various users, the Library recognizes a special responsibility for preserving U. S. imprints which are added to the collections. To avoid increasing the backlog of materials needing preservation, we must get preservation control over current acquisitions, for if we do not, we are bound to keep losing ground in preservation of our collections.

The Library of Congress employs several approaches to preservation: microfilming, conservation of original format, low temperature storage, protective storage devices such as binding and boxing, and, by default, "planned deterioration" -- the decision to allow some materials to deteriorate which is implicit in plans to focus preservation efforts on other materials. In the near future we expect to add two new and exciting approaches to this list: mass deacidification of paper materials and digital storage of information on optical disk. These new technologies will enable us to attack the problem of preserving acquisitions from two directions. Mass deacidification will greatly expand our ability to preserve works in the original paper format. At the same time we are exploring digital storage of information on optical disk for preserving items in a secondary format. Because these developments offer not only the Library of Congress but also the international library community important new tools for solving our preservation problems, I will describe them in some detail before turning to more familiar preservation methods and the possibilities for cooperation which they present.

DEACIDIFICATION

In the mid-seventies, LC's Preservation Research Laboratory discovered that in a vacuum books exposed for a few days to diethyl zinc vapor not only were left acid free but possessed an alkaline reserve which would neutralize acid attacks in the future -- for two to five hundred years. But where does one find a vacuum chamber big enough to hold significant portions of the billions of threatened pages? Much has been made in recent years of "space spinoffs" especially in the field of medicine; this time librarians were the beneficiaries of space technology. Our first application of this new technology took place in the late 1970's at the General Electric space vehicle chamber at Valley Forge, Pennsylvania, with 1,200 volumes. The results were most promising. In October 1982, in cooperation with the National Air and Space Agency's Goddard Space Flight Facility, the Library of Congress, using a large NASA vacuum chamber originally designed to test satellites destined for outer space, put 5,000 books through the process. This was the largest test to date.

The principal reasons for the Library's choosing a gaseous approach were: (1) a gaseous treatment process would minimize the risk of softening and transfer of inks, colored design materials, and other soluble materials from page to page and from one book to another; (2) the relative ease of large-scale batch treatment of millions of volumes and; (3) the high probability of low unit cost and reasonable scale up costs using known vacuum and chemical process technology.

Over seven thousand books have now been treated with gaseous diethyl zinc, and no adverse effects on any design materials have been observed. The zinc compound deposited in the Library's process has an added advantage because it is a fungistat. The projected unit cost of the diethyl zinc process will be \$3 to \$4 per volume at plant start up and will drop with process improvements and higher plant output. There are no known safety risks to personnel or books with LC's diethyl zinc process. The U. S. Congress has acted favorably on the request for construction of a 40,000 square foot building containing large vacuum chambers to be located at Fort Detrick in Frederick, Maryland, which is 50 miles from the Library of Congress. This facility would have a capacity of deacidifying 500,000 books per year. It will be the first such large-scale facility in the world and will mark a new era in the preservation of the records of civilization. The facility will be a prototype for others in the United States and abroad. It will encourage economies of preservation and acquisition for all U. S. libraries. The mass deacidification process will enable the Library of Congress in future years to preserve a significant portion of the American record, in original format as urged by IFLA's Office for Universal Bibliographic Control. We will make the technique available to others, probably through licensing the process to reputable firms or organizations in the U. S. and abroad which would set up in business to offer the treatment to any customer. In reporting out authorization to proceed with the construction of the DEZ facility, the House of Representatives' Committee on Public Works and Transportation said: "This 'first of a kind' laboratory facility will be available not only to the Library of Congress but to the library and scholarly community throughout the country, and for that matter, throughout the world."

In summary, we appear to have developed a relatively inexpensive and simple technique for wide-scale preservation in the original form. Unfortunately, this does not entirely solve the preservation problem. It cannot reverse the condition of material already brittle or damaged. Of greater importance, however, is that preservation can refer to much more than assuring the physical longevity of library materials.

Library preservation may be considered narrowly and broadly. In the narrowest sense, it means doing something to protect library materials from physical decay. This can be done by deacidification, as just described, by cold storage, by restoration, or other means. Alternatively, the substance of the work, usually the text, can be converted to a medium less subject to physical decay, like microfilm.

But preservation can have a larger sense -- it means assuring that the substance of a work is available indefinitely despite not only natural physical decay, but also theft, mutilation, and such things as damage from heavy use, and broken water pipes.

OPTICAL DISKS

Preservation in this larger sense prompted the Library of Congress to undertake another experiment. This experiment is with preservation by digital storage of information on optical disk. The three-year Optical Disk Pilot Program will evaluate the use of optical disk technology for information preservation and management and determine the costs and benefits of such technology when used in a production setting.

In contrast to microforms, optical disk technology affords extremely high-density storage of information. A one-sided 12-inch digital disk can store between 10,000 and 20,000 pages of text depending on the resolution required. One side of an analog disk can store up to 54,000 images. This technology represents a potentially efficient and economical way to store and retrieve images. Optical storage also avoids wear resulting from continuous disk usage, since only a beam of light touches the medium during playback. In addition, information on the digital optical disk can be transferred to a new disk without any loss if changes are detected in the original disk. It could thus be valuable as a preservation format. Together, these characteristics make the disk an extremely attractive medium for on-demand retrieval of high use items.

The pilot program was stimulated in part by the Library's use of optical technology in the Cataloging Distribution Service, where the images of catalog cards are captured on an optical disk which can then be used to print exact reproductions on demand. This and suggestions from researchers at the forefront of the technology caused me to initiate several preliminary investigations and to appoint an Optical Disk Storage Technology Committee. This group defined equipment and disk specifications and solicited bids. Two contracts resulted: one with Integrated Automation to supply an experimental digital disk system for print materials, and the other with SONY Video Communications Products

Co. to supply experimental videodisks and commercial players for storage and retrieval of non-print or image-based materials. The optical disk technique possesses strong advantages for both preservation and service. First, putting the image of our material in digital form means that even if the disk lasts only 50 years -- a possibility -- we shall still be able through error correction and image enhancement to retain the data indefinitely in a form at least as good as the original. The data is coded in such a way as to provide self checks throughout so that over the years the system can monitor the change of data quality on the disk. Most importantly, the system can correct for those errors for a definite period and, when needed, provide a copy -- a new disk -- as error free as the enhanced original.

Secondly, the disks require modest storage space and can be put in secure as well as remote housing and never be touched by human hands, even though in constant use.

Such an approach to the preservation of library materials may be setting in motion a revolution in library service and organization. If our collections were on optical disk -- an enormous and costly "if" -- they would never be "not on shelf." Format would be constant, thus special format divisions for custodial purposes, at least, would become unnecessary. Delivery time would be perhaps several minutes, at most. A reading room would be the location of an appropriate terminal. Life of the material would be long term. Storage space would be modest and totally different from existing bookstacks.

This would bring about changes in acquisition, cataloging, reference, and lending, and portends radical change in every facet of librarianship, including the basic structure of our libraries, and of present systems for publishing and distributing information throughout the world.

This is a glimpse of the way things could be, but there is, needless to say, a great distance from here to there. We expect the Disk Pilot Project to provide answers to some questions which cloud the present view -- questions of the cost of the necessary machinery for optical disk preservation, costs of operating the machinery, life span of the disks, quality of their image, usability in reading rooms, vital copyright issues, etc.

On June 15, 1984, the Library made available to users the first of six analog video disks produced during the initial phase of its Optical Disk Pilot Program. Installed in the Prints and Photographs Reading Room, the disk with its player and a video monitor enables Library patrons to sort through quickly or stop and study any one of almost 40,000 photographs, posters, architectural drawings, and other pictorial items from the prints and photographs collection. As copyright permissions are secured, five other disks will be put into public use, containing 10,000 images from the Prints and Photographs Division; almost 100,000 motion picture publicity stills from the Motion Picture, Broadcasting and Recorded Sound Division; a selection of about 30 titles from the paper print collection of pre-1910 motion picture films; and two television newscasts from July 3-4, 1976.

All of these materials are bulky, difficult to organize and store, costly to service, and highly susceptible to damage if heavily used in original format. In addition to offering attractive features for preservation, both digital and analog disk storage seem to offer unparalleled high-speed access to library materials, including some of the most fragile and important materials in the Library's vast collections.

SHARING OF PRESERVATION METHODS INTERNATIONALLY

The Library of Congress has invested extensive human and financial resources in scientific research and the development of methods for preserving library materials, methods which can be adopted by other libraries throughout the world. Mass deacidification and optical disk technology are the most recent and dramatic examples of this effort, through which the Library seeks both to deal with its own preservation problems and to contribute to the building of a national and international preservation capability.

The Disk Project represents the latest in applying technology to the capture, storage and retrieval of information, and follows naturally from the Library's long-standing engagement in microfilming as a secondary format preservation technique. A brief review of preservation filming developments will clarify additional important issues affecting our ability, nationally and internationally, to cooperate in responding to the preservation challenge.

The Library of Congress today has almost 300,000 reels in its master negative collection, containing nearly 300 million pages of information which might otherwise have been lost along with the crumbling paper on which it had been printed. When we first began microfilming half a century ago, there were no standards, no conventions, no established procedures. Because our Photoduplication Service, and its younger companion unit, the Preservation Microfilming Office, are such large-volume operations, their daily procedures had to be developed with precision and documented extensively to insure consistent staff training and uniformly high-quality production. Through the years our competent and dedicated staff have played a vital professional leadership role, sharing their knowledge and experience in the creation of the technical standards, specifications and guidelines which now govern preservation microfilming in this country and which have had a significant influence on such activities elsewhere in the world.

Most of the titles we have filmed were selected in response to our own internal preservation priorities. Newspapers and serials constitute the largest segment. We presently film some 1,500 titles on an on-going basis, representing virtually every area of the world but with special attention to Latin American gazettes, and the gazettes and major newspapers from South Asia. Backfiles of many of these titles have also been preserved on film. In addition, we have consistently included brittle monographs in all subject areas in our filming program, as well as manuscript and other special collection materials.

Because service copies can be printed from master negatives at a fraction of the cost of the initial filming, microfilming is an attractive cooperative method for preserving the content of deteriorated items held by more than one library. Working with other large research libraries -- most notably the New York Public Library in a long-standing bi-lateral arrangement for filming foreign official gazettes, and with the more recent Research Libraries Group project to film late-19th Century American imprints -- the Library has supported the development of procedures for the coordinated selection and preparation of brittle materials, and for the bibliographic control of microforms which is so essential for eliminating costly duplicate filming.

Even though the optical digital disk will supplement and may eventually replace microfilm as a storage medium, the basic requirements for selection, preparation and bibliographic control are not likely to change. Furthermore, there are many areas of the world in which microfilm is likely to be the only practical and affordable technology for many years to come. Consequently, the expansion of existing models for cooperative preservation filming to an international scale is highly desirable.

I have already indicated that the Library of Congress recognizes its special responsibility for the preservation of U. S. imprints, and have suggested that other national libraries accept a similar responsibility for the output of their own countries, in the same way that the principle of Universal Bibliographic Control allocates responsibility for cataloging among the nations of the world. At the same time, we recognize that not all countries currently possess the financial and technical resources to accept this responsibility immediately, and that the scholarly and research needs of our own users encompass materials from everywhere. Therefore, we will not exclude significant materials published in other countries from our microfilming program unless and until a commitment to their preservation is assumed by other libraries, governmental agencies or commercial micropublishers.

We wish to hasten the day when such an international division of responsibility can be achieved, and to do this requires improved communication about existing activities and coordination in planning expanded efforts. Such coordination is essential at two distinct levels:

To avoid costly duplication of effort, title-specific information about items preserved on film by one institution must be rapidly available to others, and our steadily expanding bibliographic systems and networks now make this an achievable goal. Records for microform masters, formerly distributed through the manual **NATIONAL REGISTER OF MICROFORM MASTERS**, will henceforth be included in the automated **NATIONAL UNION CATALOG**; and RLG's RLIN system has been enhanced to include records from contributing institutions from the moment a title is selected for filming. The latter records are available on-line to any institution having search access to that system, and are also cumulated and distributed off-line to interested parties. Thus the basic framework for sharing title-specific data has been established; what remains is to increase coverage (including the retrospective conversion of records for materials filmed earlier), and to expand the number of institutions -- in the U. S. and elsewhere -- making use of these tools.

This need points to the second level of communication and cooperation required, that of coordinating procedural and program planning and implementation, for which different kinds of tools are necessary.

In April 1983 the British Library began publication of Library Conservation News, a current awareness bulletin "for everyone concerned with conservation matters." It aims to provide a clearing house for information of all kinds, including news, book reviews and article abstracts. Sir Harry Hookway, who retires this year as Executive Director of the British Library, began this publication at the time he was Chairman of the Conference of Directors of National Libraries; that body had been active in sharing information on preservation activities in their respective institutions during recent years, and the publication is assisting communication among those concerned with the preservation and conservation of library materials.

Complementing the British Library's initiative, the National Preservation Program Office of the Library of Congress will begin publication this winter of a newsletter reporting both on the Library's internal preservation activities, techniques and research, and on those events, new programs, grants, workshops, regional/cooperative activities and other developments which support the growth of preservation work everywhere. This fall's expansion of the staff in that Office also enables us to participate more actively in cooperative program development -- currently focusing on work with the American Library Association's Preservation Section, with the Preservation Committees of the Association of Research Libraries and the Research Libraries Group, the Council on Library Resources and with new or expanding regional programs in the U. S., especially in the Northeast (NEDCC), the Southeast (SOLINET), the Midwest (MCCP), and the West (UC). Many of the policies, procedures and communication channels developed by these cooperative efforts could be readily adapted to international programs.

UNIVERSAL PRESERVATION PROGRAM

The Medium-Term Programme 1981-1985 of the International Federation of Library Associations and Institutions includes the issues which are seen as important for IFLA as a whole and for which significant progress should be made during this period. The goal of IFLA's major programs is the provision of access to information: that is, access to all published information for all citizens of all countries. The Universal Availability of Publications (UAP) focuses IFLA's activities for access, both national and international, to known publications. The Universal Bibliographic Control (UBC) program aims to have produced one bibliographic record for each publication, once and for all; to eliminate duplication of effort in bibliographic recording; and to provide records which are internationally standardized, internationally compatible, and internationally available. Great progress has been made since the establishment of the International Office for UBC in 1969. An International MARC Office was proposed by the Conference of Directors which would enable a wide ranging program based on the International MARC Network to be undertaken in cooperation both with national bibliographic agencies and with IFLA's Sections and other units. National libraries are providing support for the development of a UNIMARC system which can also be adapted for application in developing countries.

The Medium-Term Programme 1981-1985 includes Conservation among its important programs and says the following: "Until recently it was believed by many that conservation was of concern only to national libraries and to research libraries in the humanities. It is now becoming recognized that conservation is of fundamental importance to all libraries and information services." Preservation has held the attention of the Conference of Directors of National Libraries for several years. At recent meetings proposals have been made to convene a symposium on the subject to develop a policy for preservation. The National Libraries Section of IFLA has listed as its first project for the medium term "Guidelines for the exploitation and preservation of the national imprint, for the benefit of the user."

As I said earlier the Library of Congress has accepted the challenge of IFLA's Office of Universal Bibliographic Control to preserve the American record. To do this we must first get preservation control over current publications, and we will concentrate on preserving U. S. imprints. We shall continue to share with the library world the information we obtain from our experiments with mass deacidification and with the optical disk, as well as our more traditional methods for collection maintenance, preservation microfilming and conservation treatment. I hope that we can enlist the interest and support of the Conference of Directors of National Libraries and IFLA to develop a program for preserving the world's information resources modeled after the UBC and UAP concepts. The visit to LC of the Directors next August will, hopefully, stimulate this. Better developed countries can establish models using some of the advanced technologies I have described. Lesser developed countries can use less complicated methods, but it is essential that standards be established for the universal preservation program, perhaps with the aid and support of UNESCO.

Before developing this paper for presentation, I held a meeting of key staff who are knowledgeable of the preservation needs and activities at the Library of Congress, to discuss how international cooperation in this area can best be achieved. It was an educational process for us, and this document reflects some of the group's suggestions. They agreed that we need to communicate with administrators, university presidents, and those at national levels to make them aware of the need to take the responsibility for preserving the record of the past using the technologies which are now available to us. They also agreed on the necessity for continued and expanded support to increase the number of professionals and technicians competent to carry out the wide variety of tasks involved in preserving library collections -- through publication programs disseminating both basic and specialized technical information, through workshops and other continuing education opportunities for existing staff, through internships in both conservation laboratory work and preservation administration, and through formal academic programs for young professionals.

The last decade has seen a dramatic improvement in the level of awareness about the preservation problem, in the variety and quality of the methods and techniques for combatting it, and in cooperative mechanisms for pooling resources to do the job. To develop a truly international approach to preservation, we have but to build on these accomplishments. The Library of Congress accepts its share of responsibility and invites other national libraries and the international library profession as a whole to join in the effort to ensure that the accumulated resources of all the world's libraries may continue to be passed on to the generations who follow us.

Paper No. 12

THE RESEARCH LIBRARIES GROUP, INC.
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"The Electronic Library"

by
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THE ELECTRONIC LIBRARY

Patricia Battin

Columbia University

I am not going to talk about technology, nor about the extraordinary achievements of the library profession during the past decade in the application of computing and communications technology to our internal operations. The greatest reward perhaps, for our efforts, is our unprecedented dependence on services over which we have no control. The truly radical change for research libraries caused by communications technology is external. I would like to explore today the impact of the "wired" scholar on the university's traditional organization of its information services and the enormous opportunity for leadership by the library profession to integrate the new technologies into the teaching/learning/research process in a manner consistent with the academic purposes of the university rather than the imperatives of the technology.

On many of our campuses, the plans to "wire" the campus have proceeded with very little involvement or recognition of the function of the institution's traditional information system—the library. And in the library profession, we have engaged in an intensive decade of designing the technical groundwork for the wired scholar in virtual isolation from our colleagues in the scholarly community.

It is ironic that the disciplines of engineering and computer science, which are essentially leading the information technology revolution and the development of academic informtion systems, are the two disciplines in the university which have been traditionally the least dependent upon library services and support. If the academic purposes of the university, rather than the imperatives of technology, are to drive the introduction of information technology into the university, it is essential that we draw on the strengths of all three disciplines.

The challenge for universities is not simply to explore the role of computers on campus--as so many institutions have interpreted the issue--but the integration of information technology into the existing information system in a way that preserves the linkages to the existing knowledge base, encourages and stimulates the productive use of new technologies, and provides coordinated gateway access to the universe of knowledge in a manner convenient and invisible to the end user.

The paradox of our situation is that the achievement of that goal, because of the character and cost of computer and communications technologies, will require a substantial level of initial cooperation and centralization which runs counter to the strongly autonomous nature of scholarly inquiry. The very diversity of scholarly information needs requires in the electronic age an unprecedented degree of centralized, coordinated linkages and compatibilities to serve that diversity and permit the autonomy necessary for productive and creative scholarship. It is essential that we do it well, and that scholars from all disciplines participate, instead of letting it happen to them, because I am convinced that the manner in which universities integrate and use the new technologies will have an enormously significant influence on the strength and vitality not only of higher education, but our society as well.

In addition to our traditional services in support of scholarship, the wired scholar now requires a new dimension to our routine services: access to information no longer packaged in neat bibliographical bundles. Nina Matheson has noted that "we need to keep in mind that information is not a property of documents, nor of bibliographic records, but the relationship between the data and the recipient. Increasingly, the burden and responsibility of libraries in the Information Age is to deal with that relationship." [1]

Chemical Abstracts represents a good paradigm of this new relationship and the financial, organizational, and scholarly implications of our changing systems of communication.

At the present time, the University through the Libraries makes the printed copy available to students and faculty at no cost to the individual. Chem Abstracts is also available in machine readable form through the library's institutional access or password. Typically, a reference librarian trained in the specific protocols performs the search for the client who pays the line charges and cpu costs. Now, researchers with personal computers want direct access to the database from a variety of locations. ACS does not have the capacity to accommodate the uncontrolled multitude of individual users, so in response to this need, ACS now provides for an annual fee of $6000 one institutional password to be used ad seriatim in the institution during off-peak hours, which are after 2 p.m. EST.

There are several significant points to be noted:

1) For the forseeable future, an institution must provide all three types of access. One is not a substitute for the other:

—certain kinds of scholarly inquiry require the information capacities provided by the printed format

—there will always be students and faculty who require access to CAS but who are not sufficiently specialized to possess the skills for independent searching of the database

—there will be a core of specialists with personal computers who require direct access

2) The costs are not substitutional, but substantially incremental

3) The fragmentation of access to data bases is inimical to the academic purposes of the institution. Therefore, a centralized infra-structure is required to make sure that access to all available information sources is coordinated and provided on an institution-wide basis to eliminate the costs of redundancy.

4) The traditional procedures for allocation of costs and the control of expenditures have undergone a radical transformation.

Another example of the current anarchy is the following treasure hunt:

In January, 1984, a graduate student in Dr. Beychok's lab asked Barbara List, Science Division reference librarian, if she could find a table giving the complete protein sequence for E. coli RNA polymerase. She knew that the sequence had been completed in the last year and said that the work had been done by many different researchers who published their results in many different journals. She had also heard that the National Library of Medicine had a data base that might contain the answer.

Various books in the Biology Library supplied parts of the sequence, but not the whole sequence. Chem Abstracts had many citations but not the actual data. Eventually, via the New York Academy of Medicine, Barbara connected with a lab at the National Biomedical Research Foundation at Georgetown University. They had the sequence in a set of 7 tables which they would run off and send to Columbia. They also told her that the National Institutes of Health had just acquired the data bases and they would become public sometime in April 1984. Up to that time, an individual had to make special arrangements for access. As it then turned out, after all these efforts, one researcher at the Cancer Research Center, College of Physicians and Surgeons, Columbia University, had such access; but no one else knew it.

Another example involved a specialized data base produced by Bell Laboratories. A researcher in the social sciences, wishing to use this particular data bae, called Bell Labs to find out how to gain access to the data and was told that it was already available on Columbia's computers for researchers at the Health Sciences.

And to dispel the persistent myth that information needs can be categorized and confined to a given faculty or discipline, a review of our searching logs for the BIOSIS database for the past few months indicates that researchers from Geography, psychology, law, anthropology, and Teachers College requested literature Searches from BIOSIS.

So, if we now back off and look at the information scene from a global point of view, that is, the perspective of the Electronic Scholar, sitting at his/her p.c. at home or in the office in 1984, this is what we see:

—a huge stock of books and journals, housed locally and across the world, reasonably accessible--although in slow and inconvenient fashion—through internationally standardized protocols. The overwhelming majority of these access protocols--card catalogs and printed indexes—are not yet available at the workstation. A small percentage of the bibliographic records are available in machine readable form.

--a well-designed and internationally standardized machine-readable format for the control of bibliographic access to information in a variety of formats.

—the national capacity to link existing bibliographic data bases.

—a growing number of scholar-generated machine readable data files with no orderly form of access. The invisible network is generally the source for information about these data bases.

—a growing number of commercially available data bases, again with no orderly form of access. Currently, there are 1600 of these data bases, of which 38% require some sort of subscription fee in addition to computer time and communications charges. Columbia provides access to around 350 at the present time. Lists published by the Libraries, either in flyers unevenly distributed around the campus or on computer bulletin boards, are the ususal means of communication about these resources.

—Incompatible hardware, software, and communications networks which have developed out of the normal scholarly characteristics of autonomous entrepreneurship in the pursuit of knowledge.

--Inefficient expenditure of individual and institutional funds because of lack of agreement on institutional compatabilities and standards, duplication of resources which could be shared, waste of faculty and student time in identifying information resources and seeking access to them.

—Serious questions involving copyright and the ownership of information, which threaten the traditional unobstructed access to scholarly information.

—Increasing shift of cost of use of information sources to the individual, with the resulting division between information haves and have-nots within the academic community.

The obvious answer to the Electronic Scholar's plight is the formation of a Scholarly Information Center by merging the Libraries and the Computer Center to provide an information infra-structure to stimulate the continuing autonomous use of information sources. The integration of the Libraries and the Computer Center, each with their specific strengths and expertise, will provide one-stop shopping for the University community as well as a stabilizing planning mechanism for effective and flexible response to rapidly changing technologies. The Electronic Scholar will require both the capacity for flexible response to change as well as the assurance of stability as he/she becomes dependent upon electronic information systems.

You may have noticed that I haven't said anything about money and who will pay. That topic is a lecture in itself, but I would just like to mention a few of the more troublesome issues.

1) Traditionally, universities have subsidized the process of scholarly communication through books and journals by supporting library services and have passed on to users the costs of access to computerized information.

2) In the print era, universities provided subsidized browsing by purchasing books and journals and making them freely available to members of the university community.

3) The costs of publication and dissemination of research have been traditionally borne by the scholar and the publisher, not the university.

Technology has shattered these comfortable simplicities. The vastly expanded potential for expensive services makes it necessary to analyze our information functions, regardless of format, and establish new policies for centrally subsidized services with a series of optional, incremental fee-based services available on request. It is important that faculty participate in the identification of those services to be included in the tuition in order to avoid the unacceptable intrusion of economic discrimination into the academic process.

Publishers are moving as rapidly as possible to a fee-per-use basis for supplying information. I think the scholarly societies have a significant responsibility in this arena to prevent the loss of control over scholarly information to the commercial sector. We need to seek fair and equitable accommodation with academic publishers to permit afffordable, subsidized browsing. One suggestion has been the purchase and local maintenance of heavily used data bases, such as Chem Abstracts. At the present time, the cost of the purchase of Chem Abstracts is $18,000 per year per year. In other words, if Columbia wanted to buy 10 years from 1974-84, the cost would be $180,000 per year.

The workstation will provide the scholarly capacity for scholar-driven dissemination of machine-readable products of research. Who will pay the overhead and storage costs for scholarly output -- these costs represent another set of incremental costs not now included in the University's budget.

And finally, how will we fund the availability of trained subject specialists and technical consultants on the staff of the Scholarly Information Center to provide a wide range of services to a clientele ranging from the freshman to the specialized scholar. We now provide search services to about 350 commercial data bases. Our reference librarians need continuing education to update their skills as protocols change and new specialized resources become available. Both the Computer Center and the Libraries could easily expand their user services staff several times over and still not meet the demand, which shows signs only of increasing as knowledge continues to explode.

If we assume that we are successful in reorganizing our information services to reflect the new capacities and that we miraculously resolve the financial and copyright issues, our Electronic Scholar of the 90's will find the following opportunities at the workstation:

—On-line gateway access to the universe of knowledge

—Bibliographic data for all printed works and machine-readable data bases and files

—Extremely user friendly access by natural language subject searching, keywords, titles, etc.

—Boolean logic, call number searching, backward and forward browsing

—Information on on-order and circulation status of documents

In short, the capacity to rummage around in the bibliographic wealth of recorded knowledge, organized in meaningful fashion with logically controlled searches.

—Downloading capacities and local interactive manipulation of all files

—Full text access to databases, data files and published works also preserved on optical disk

—High resolution graphics capability

—Capacity to order off-line prints of machine readable text; facsimile transmission of journal articles identified through on-line abstracting and indexing services; and/or delivery of printed publications

—Links to printed works through on-line indexes of books, tables of contents, etc.

—Access to current scholarly output through author-supplied subject access

—Access to on-line Pre-print Exchange, with papers maintained on-line for six months and then purged unless refereed and preserved in archival record according to scholarly standards. The refereeing process would be coordinated by a national network of scholarly societies with accepted data-sets being maintained at the home institution and entered into the national data resource --either RLIN or OCLC, now linked into one national resource

—On-line access to education, training and consulting services run by Scholarly Information Center

—information on new services and access

—technical information on hardware, software, etc.

--tutorials and consulting services on literature structures, protocols for specialists, seminars for beginners

--literature search services for those who don't want to do their own

According to the traditional cliche, the Library is the heart of the University. I think it is time for a new metaphor — and that metaphor is more appropriately the DNA. The new process will be a helix — we provide a basic set of services and technical capacities, users interact and experiment with the new technical dimensions and develop new requirements which then influence the evolution of a new shape for the infra-structure. As the genetic code of the University, the character and quality of the Scholarly Information Center will determine the character and quality of the institution.

And that is why it is so important that we find a way, as a community of scholars, to counteract the fragmenting forces of traditional fiercely-held autonomy, the chaos of market-driven incompatibilities, and resistance to change and seek new ways to collaborate effectively to exploit the power of the new technologies in the collective interest of the community. Gerald Holton, in a 1977 essay describing the fruitless contemporary search for a unity of knowledge — a synthesis of science and the humanities -- concluded that as a result of the lack of such a unity, "the need is greater than ever to recognize how small one's own portion of the world is, to view from one's own narrow platform the search of others with interest and sympathy, and so attempt to re-establish a community of learning on the recognition that what binds us together is perhaps chiefly the integrity of our individual concerns."

If we can do that, we will leave a legacy for scholarship and the Electronic Scholar as invaluable for the life of the mind and the advancement of scholarship as the book collections amassed for us by our predecessors.

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Paper No. 13

THE RESEARCH LIBRARIES GROUP, INC.
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"Co-operative Networks and Service to the Scholar"

by
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Co-operative networks and service to the scholar: university library resources for on-line research

Brenda E. Moon
Edinburgh University Library

The needs of the scholar are seldom the primary needs to which librarians point, in Britain at least, when arguing the case for subscriptions to co-operatives, communications equipment, recon projects, etc.. We are conditioned to stress first the administrative and economic benefits, because we are generally making the case not to the academic so much as to the financial board. In constructing our on-line networks we have to keep potentially incompatible objectives in view: the organisational needs of the library, the budgetary restrictions of the university, the public obligation which comes with the stewardship of a national asset, the immediate needs of today's readers and the potential needs of tomorrow's research.

Of necessity university libraries in the past twenty years have given priority to organisational and budgetary considerations and have for the most part designed their systems independently, co-operating with other groups of libraries for particular purposes such as inter-lending, and in particular fields such as oriental studies, but rarely in an integrated or comprehensive way. Still less have they collaborated with other agencies such as archives, computer centres, government bureaux, and so on in designing their systems and services.

There is now an urgent need to check our hypotheses about the needs of our academic colleagues, and to explore appropriate ways of meeting them, keeping as our fundamental objective the enhancement of access to the collective resources not only of our libraries but of other repositories too.

It is of course difficult to generalise about the needs of scholars. Few people are more idiosyncratic. Some scholars are still going about their research in the same way as they would have done fifty years ago, even though they may be aware of new techniques. They may have tried the new technology and have found either the machines or the software or themselves wanting. Machines still fall far short of men in their capacity for suspicion, discrimination and prediction in non-quantifiable situations. But in other fields the methods of scholarship have been completely transformed in the past decade.

In this paper I shall try to show how scholars are conducting their research today in a Scottish university, and how they might be aided in the future by action which it is, or should be, open to us to take. In the space of this paper I can do no more than offer six case studies, examples drawn from a wide range of disciplines; but even so small a sample can indicate dramatic adjustments which we shall have to make if we are to serve research.

* * * *

Dr. C. is preparing a critical edition of Carlyle's letters, as one of an editorial team of five, two of whom are in Duke University. With joint editors in two countries the usual problems of communication in collaborative research are exacerbated. The first step is to compile a list of all known letters. Previous editions must be searched, advertisements soliciting new material must be placed in the TLS and other appropriate journals at intervals, and archivists of likely repositories must be approached. This is all done by personal contact or correspondence.

Once a Carlyle letter has been traced, the original is examined if at all possible, and in any case a facsimile is obtained. It is at this stage that authentication takes place. There are two Thomas Carlyles, but a glance at the manuscript will tell the scholar which of them wrote it.

The facsimiles are filed in a fireproof cabinet in Duke University and copies are typed out. Typing of course introduces the possibility of human error, but carelessness is not the only hazard. Cross-written letters and damaged manuscripts are easily misread, and fumigation has rendered certain letters - those from John Aitken Carlyle MD to and from Italy, which were fumigated against cholera in the nineteenth century - scarcely legible.

After checking against the originals, the typescript copies must be arranged, annotated, indexed and prepared for the press. Copy is transmitted to and from the press by airmail, presentation following agreed house rules. These can give as much trouble to literary editors as to cataloguers, and international collaboration does not always produce a harmonious effect: the Duke-Edinburgh edition of Carlyle's letters will have the text in British spelling and the footnotes in American spelling. The text must be proof-read and corrected before printing; the illustrations must also be selected, reproduced and transmitted by airmail.

Dr. C. has been working on this edition of Carlyle for some years, and is still using the traditional methods, depending on manuscript, print, airmail and personal contact. I asked him how he would like to see the new technology help him in his research. Clearly instant access to a wide range of up-to-date catalogues and inventories of libraries and archives would help. But he thought there was a long way to go before this could be provided in a co-ordinated way via a computer network. The bibliographic sources to be searched were too diverse; for every archive has its own syle, and its own staff to explain the style, and Dr. C. saw no likelihood of overcoming incompatibilities in the foreseeable future. A Scottish scholar using a Roman library catalogue expects to have to do as Rome does. Networking would never replace the need for adaptation to national traditions in the humanities, not to mention the craving for overseas travel.

Could optical character recognition devices be used to produce the text for the printer directly from the original manuscripts? He doubted it: it would certainly eliminate error arising from human carelessness and he was impressed to hear that new, sophisticated OCR readers could cope with handwriting, but the problem of palimpsest, cross-written and damaged manuscripts would remain.

On the other hand Dr. C. saw immediate advantage in the text-processing and laser-printing facilities now available to editors. The elimination of laborious proof-reading, the ease of collation and indexing, and the discipline of consistent observance of house rules prompted by computer processing of text were obviously attractive. And it requires little stretch of the imagination to envisage special advantage to collaborative textual researchers in networked access to files of documents. Scholars at widely separate desks could have access to the same collection of texts without purchasing additional fireproof safes and maintaining duplicate files of dogeared paper still cut to different standard measurements on either side of the Atlantic. Whether access is by cable, satellite or optical disc will be a financial rather than a technical question, but it seems inevitable that computer transmission of text will replace air letter when security, accuracy or currency are important.

* * * *

Professor M. is also engaged in textual research but takes a completely different approach. He is a mathematician who has collaborated for some years in authorship studies - first on Pauline epistles, more recently on the

Homeric poems. If you want to conduct a truly objective, scientific study of authorship, he argues, you must throw all literary criticism out of the window; you must put aside literary prejudices and concentrate on close observation. He looks for the unobtrusive habits of style rather than those which attract the attention of literary critics, when seeking a means of identifying forgery, adulteration of text, or the hand of the editor. Only the obvious is imitated, and the true identity of an author is given away not by familiar mannerisms but by the combinations of insignificant workds such as 'but the'. Even the niceties of punctuation hold no special interest for Professor M. 'All authors use words; not all use punctuation.' Authors develop habits of word juxtaposition, however, at a very early age, so that authorship validation methods do not lend themselves to chronological studies.

What Professor M. needs most is access to archives of machine-readable texts. Conversion of literary texts to machine-readable form is slow and expensive, whether an optical character recognition device is used or not. With many OCR machines such as the KDEM accuracy levels drop rapidly when the print quality of the original is poor. Text conversion being expensive, it is sensible for work accomplished by one researcher to be made available to scholars generally. In Britain the Oxford Text Archive has been given the task by the Computer Board of amassing a corpus of literary texts and making them widely accessible. Similar archives exist in the United States - the Thesaurus Linguae Graecae at Irvine here in California, for example - and elsewhere. Once a text is in machine-readable form and proof-read, Professor M. claims, you do not need to refer to it again in its original form at all for his kind of research.

There is clearly a need for international access to text archives, and not only to the textual data itself but to catalogues of the holdings, so that work is not duplicated. Scholars also need advice on text conversion and analysis, concordance construction and standards. The adoption of standards is as important here as in the creation of bibliographic databases. The symbol for additions to text ([ ] or < >?) is a case in point. If text archives are to be of maximum use to scholars the world over, standardisation of text markers is essential.

Anyone working on textual analysis of this kind will need considerable data storage capacity. The works of Scott, for instance, occupy approximately 24 mb and with full concordance facilities about 500 mb are required. Sophisticated laser-printers with EPS graphics will also be needed, and these are still quite expensive in Britain. But here is a new way of obtaining books, reading them, editing them, indexing them, copying them and printing them with apparatus criticus. There are still huge problems of copyright, storage, communications and quality reproduction, but for certain types of s study this is an alternative to library-based research.

* * * *

Dr. H. is producing a critical bibliography of Ronsard, with a basically thematic arrangement and author and subject indexes. He is experienced in using computing facilities for information storage and retrieval but he has had difficulty in tracking down a suitable software package which will, for example, number the entries and permit adequate indexing, and provide for input of languages other than English. At present compilation and sorting has to be done on the University's networked multi-access system. The file is then transferred to disc and edited, accents being added, after which the edited file is transferred to the mainframe and held there. What Dr. H. really wants to produce is camera-ready copy from one simple input of data.

Dr. H. collects information for his bibliography mainly from secondary sources, most of which are available only in hard copy. He does, however, take advantage of the MLA database and OCLC records. As with all bibliographical research, he depends heavily on library catalogues and he is looking to libraries and library networks to enable him to copy their bibliographical records into his own process. Very few libraries yet provide this facility, even to members of their own enstitutions. Even fewer have secured rights in other libraries' catalogues on behalf of their readers.

Dr. H. also needs to access archivos, but archive repositories are notoriously lacking in indexes. Access to archives is opening up with the growth of microform editions of record collections, but microform sets are rarely indexed. Few catalogues of manuscript collections are yet available in machine-readable form. With the growing consciousness of the security and conservation factors, there is in fact less interchange of manuscripts now than there was twenty years ago. It is now rare in Britain for a library to transfer a manuscript or group of manuscripts to another library on a temporary basis for the use of a scholar there, although the French are still willing to transfer archives from the Départements to the Bibliothèque Nationale for specific study purposes. If conservation denies a scholar the original, what will the librarian provide by way of compensation? Digital image transmission must be part of the answer, with adequate safeguard against unauthorised downloading or printing out.

When Dr. H. has completed his work he must decide how to publish it. If in hard copy, he will want to send text to the printer without further input of data. But he can, after all, release it to the world in machine-readable form through the appropriate academic network or through the public telecommunications network. What dissuades scholars from taking this simple step? Firstly, the quality control afforded by refereeing or market forces is lacking. Secondly, there is no easy recompense for work done. Thirdly, there will be ongoing costs in terms of storage and maintenance of files, and the risk of congested communications lines if such use builds up. Until academic institutions have come to terms with the problems of quality control, marketing and distribution of the data which they generate, this method of publication does not seem likely to gain popularity. Only a growing confidence in licensing arrangements and optical disc storage can tip the balance.

* * * *

Dr. W. is working in an entirely different field. He and his colleagues in the Department of Forestry have been studying populations of trees in an African forest. He has never depended entirely on the Library for access to the relevant literature in his subject. He has accumulated a collection of over a thousand offprints which he makes generally available in the Department. He has listed these on-line, following the form of bibliographic citation in common use in the most familiar forestry journals, and providing keyword indexes. Did other staff in the Department maintain similar records? Yes, and it would certainly be a good idea if they could all be combined so that any offprint in the Department could be identified and located quickly, but there were problems, he said, of incompatibility. Different members of staff had been using slightly different forms of entry and had developed their keyword indexes independently. I began to see the Department of Forestry as a microcosm of the library world.

But why go to such lengths recording journal papers when there are so many indexing and abstracting sources which supply the same information and more? He explained that his listing covered only those papers which he had found to be seminal in his field, and related to actual offprints. He emphasised that the volume of unevaluated data produced in the major abstracting tools was a hindrance rather than a help. On the other hand he saw a real need for extending on-line coverage of the literature backwards in time for those journals of major importance in his field. The Commonwealth Forestry Bureau is currently maintaining its journal Forestry on-line, accessible through JANET, but in order to extend this coverage retrospectively he farms out volumes to his students to index as an exercise in computer modelling, and has thus much improved the bibliographic control of this journal in the University Library. Student labour is cheap.

How far, I asked, does Dr. W. rely on the large commercial databases such as BIOSIS? Quite considerably, but the lack of selectivity was a problem. It was not simply that one retrieved too much - experience in search techniques could reduce the volume of printout - but the value of much of what one retrieved was small. He saw two major changes in database access as crucial to research: firstly, the facility to download into one's own process and so select at leisure, and interrogate as required; and secondly, the opportunity to access directly without the mediation of a librarian. I drew his attention to the financial implications, but he did not see why librarians should not provide hands-on terminal facilities and formal instruction in accessing commercial databases. The librarian might log on initially, then say 'Your line, Mr. X, will you take this call on terminal three please?' A maximum of fifteen minutes at a terminal would concentrate the mind wonderfully on devising time-saving search strategies. As far as I know, no British library yet offers this kind of service. Librarians still guard the gateway to Dialog or Blaise as computer operators used to guard their mainframe temples. They have outgrown that now, moving with the technology. But then computing services sprang for the most part from different origins - from teaching departments, whereas library services have traditionally been all too little integrated with teaching programmes, and librarianship as a career was separated at a tender age from the teaching profession.

Dr. W. also needs to create his own datasets on the ecology of forest trees in Africa. A count of seedlings of twenty species graded according to five size bands over a thousand acres produces ten thousand observations. Early attempts to cope with data of this kind by computer were hampered by the constraints of Fortran and SPSS programs which entailed a fixed format. Using Prolog, he can now devise an expert system which leaves him much more freedom in handling diverse data on ecological subjects. Datasets can now be more simply merged. Artificial intelligence and expert systems are of growing importance to the scholar.

* * * *

Dr. B. is working on an ecological survey of a different kind: a comparative study of family structure and health in nineteenth century Montreal, Glasgow and Belfast. He has developed the traditional literature-searching skills to a high degree, with very little assistance from the Library. He begins by compiling a list of items to be read. For the most part he finds these in a conventional way by searching learned journals with a bibliographic content such as Victorian studies or Urban studies yearbook. He will also consult reference works such as Social science citation index in hard copy, but finds most of them difficult to use. He never uses abstracts. He compiles from these sources a list of what he needs to see, entering it on-line in his process on the University network. It would be a great help of course, if the bibliographical content of his source journals were available on-line and he could simply transfer the entries automatically to his process. But he has been at the game long enough to know that even if the data were available on-line, assimilation would not be that simple. The two major blocks, he finds, are firstly differences of terminology and spelling between North American and British sources, and secondly the variation in the form in which journal titles are entered.

Having identified items to be read, he must then locate them through library catalogues. Is this in Edinburgh University Library, and if so, where? At present it takes him an average of three minutes to check every item in our pure but simple guard book catalogues in the Main Library catalogue hall. He always seem to choose the wrong heading and is then redirected to another. If it is not in the University Library, is it in the National Library up the road? He does not have to leave our catalogue hall to find out, unless the item is very recent, since we have the NLS catalogue on microfiche, but he must still adjust his search strategy to the National Library's different rules.

When he has exhausted the relevant holdings of British libraries, in so far as he can discover them from the limited subject access provided, he must go over to Montreal. But here he finds material listed in yet a different though deceptively similar way. If file transfer facilities were available, there would be no chance of incorporating these entries in his list as they stand. He tracks down pamphlets only to find he has already seen them. He finds items which look new, only to find on his return that they were available on his doorstep but not indexed, or indexed under a different, unexpected term.

What Dr. B. wants is a means of checking what is available in Montreal before he leaves Edinburgh so that he can make good use of his time there, and a means of checking what is back home when he is over in Montreal, so that he does not waste dollars copying material readily available in

Edinburgh. He either needs access to the complete catalogues of relevant collections in the other country - and scholars could once expect to find the catalogues of major libraries available in printed form in most other large research libraries the world over - or he needs to be able to download records from his local library catalogue to his own process and to print out a list of items which he can check off and pass over when he sees them in Montreal as being readily available back home. The latter method is likely to be cheaper than on-line transatlantic interrogation of catalogues, but when frequently updated catalogues can be distributed on optical discs, the age of the published catalogue will have returned!

Dr. B. needs not only access to library catalogues with sophisticated subject retrieval facilities, to minimise the risk of missing items through bibliographic access terms which vary in different countries, but also access to archives and collections of documents in published form. He finds his research very much hampered by inadequate indexing of source material. Where, for instance, can he find an index to witnesses who gave evidence before Royal Commissions? His prime sources of information are not standard bibliographical tools (20%), footnotes to articles (20%), or casual word of mouth (20%), but systematic contact with archivists. There is a vast amount of information locked up in the memories of experienced professionals, and it is important for librarians to go out of their way to cultivate links with sister professions, to ensure that the data increasingly being generated in museums, archives and galleries is compatible, where it overlaps, with our own more familiar bibliographic data. Librarians have perhaps the longest experience of any academics of coping with large and complex databases. We can locate musical scores, maps, microforms and audio-visual aids, as well as books and manuscripts. There is no reason why we should not also locate pictures, museum artefacts, national monuments, geological specimens in the same way, which is not to say that we should hold them.

One simple way in which the Library can help Dr. B. is by holding directory information on-line. He can spend a morning writing or telephoning for up-to-date information on opening hours, addresses, copying or network facilities in archives and libraries. More directories need to be on-line, either through a commercial database or through a national academic viewdata service.

* * * *

Dr. S. heads a Department of Geography where the pattern of study is changing from reading and field-work to data analysis and prediction. He is deeply involved in the use and indeed the design of geographical information systems covering a wide variety of data from economic to physical. Remote sensing data is in constant demand and can be tapped either directly from satellites passing every ninety minutes, or from the service provided by the Electrical Engineering Department at Dundee. Seismological data can be obtained from the British Geological Survey up the road in Edinburgh. Agricultural census data can be obtained from the data service jointly mounted by the Centre for Applications Software and Technology (CAST) and by Edinburgh University Library. Dr. S. and his colleagues use these and other sources of data daily in their personal academic research and in their contract work for industry and government. Current investigations range from a study of the development of tropical rain forests in Brazil, in collaboration with the Royal Botanic Gardens and the Animal Breeding Research Organization to an analysis of the use of sports halls, for which the data is collected automatically by linking the cash points in sports halls up and down the country to a VAX machine in the Department by telephone line.

The Library is seen by Dr. S. as only one of many sources of research information, but as one of comparatively few media for the serving of such information. Wide access to public terminals over extended hours, relative security of equipment, and guidance of users are seen as major advantages in centering the new information services in the Library, and there will be a continuing need for public facilities no matter how many personal workstations are located in Departments. We still have public telephone kiosks.

Much of the research undertaken by Dr. S. and his colleagues involves the use of maps and the presentation of data in graphical form. They have developed an automatic mapping system, GIMMS, available free of charge to any university in Britain, which enables data to be handled in a flexible, diagrammatic way. Their CAMAP system, used to prepare agricultural and land use data for the Central Electricity Generating Authority and the Ministry of Agriculture, also offers computer-aided facilities. Dr.S. needs to be able to take census data, for example, select from them, re-arrange them and display the results in graphic and geographic form. The atlas which took twenty years to make is a thing of the past. Maps are increasingly custom built. He is commissioned to produce an atlas of Scotland which will need to be offered on-line to the public by a bureau service in which the Library will almost certainly be involved.

The main problem in this and related areas of the social sciences is the volume of data available -- not only census data, trade and employment data, housing and traffic data, but data on migration, tourism, recreation, education, health, &c.. The opportunity for plucking, selecting and presenting data from different sources in juxtaposition was never greater, so that human trends and situations can be discovered as never before, with the data handling capacity of present day computers. Dr. S. is concerned that the decision as to how much is released rests increasingly with gocernment. There are financial constraints but there are also political constraints which did not operate when manipulation was limited by the capacity of human labour, There are restrictions, for example, to be observed in the use of tapes purchased from the O.E.C.D. for research into trade patterns since 1945.

There is seldom, in the academic sector, much need for instant data. The only urgency which we as librarians normally have to meet is the natural urgency for medical information in our clinical libraries and the unnatural urgency for essay material in our undergraduate collections. We may also experience an administrative urgency which demands the use of the new technology for the transmission of agenda, minutes, discussion documents and conference papers such as this, which will be transmitted by IPSS more cheaply and far more quickly than by post. But much of the research which we serve, even in the scientific and technical fields, goes at a fairly relaxed pace. It is the volume of information to be transmitted rather than the speed with which it must be done, which makes use of the new electronic communication links so vital to research lbraries today.

There are of course other elements in research in which the library in all its diversity does not normally play a part - experiment, hypothesis, critical appraisal, demonstration. But scholars and scientists engaged in these activities nevertheless constantly need to refer to data collected or conclusions reached by others, and they may well need access to such information at their laboratory bench, in the field, in the hospital ward, in the conference room or at their desk. Librarians in collaboratio [illegible]th others must serve research not only by providing this information but by providing it where and when it is needed.

But to summarise the needs merely of the six scholars whose work we have discussed, it is apparent that we should be providing a far wider range of services than either librarians or any other agencies do at present. Scholars will need access to current information not only about their local library's collections and their availability at any particular time, but also about those of other libraries, archives and resource centres around the world; they will need it twenty four hours a day, because when they are working their colleagues across the world are asleep; they will need to be able to copy catalogue entries into their own processes, to manipulate them and to print them out - and we must do our best to ensure that our hands are not tied in this by our suppliers and that the licences which we pay for cover each of our individual readers. They will need the fullest possible subject analysis as well as name and title indexes of our holdings, including items in microform sets and government documents. They will need access to full text archives and the facility for downloading and manipulating such data. They will need data to be presented to them in a standard compatible form, with conversion software when necessary. They will need access to data generated by the academic sector through national and international academic networks such as JANET (UK) and EARN (European Academic Research Network) and to data generated by the public sector through the public telecommunications network. They will need controlled, hands-on access to commercial databases and instruction in how to use them. They will need facilities for reproducing and transmitting both text and illustrations from library originals in a form suitable for publication, and the means for storing, sharing interactively with their colleagues, and releasing generally or to specified groups the fruits of their research.

Not only must we provide them with these facilities from public terminals in our libraries and from workstations linked to the campus and public telecommunications network, but we must ensure that the information we generate is compatible with and integrated with that other information which they need - information, for example, about the geography, climate, soil, excavated sites, museum holdings, flight schedules and local bylaws which an archaeologist departing for Crete might need alongside his list of bibliographical references or his catalogue of clay tablets. We should be talking not only to our campus computer managers but to our colleagues in other information agencies, educational institutions and research establishments.

It used to be our typists, our counter assistants and our cataloguers who became restive at the direction the technological revolution was taking; but we who direct libraries have not been nearly restive enough. Librarianship as a profession is, after all, comparatively young, far younger than our libraries. As the distributed catalogue, albeit no longer printed, comes back into its own, maybe we shall find that the sources of information and the fountains of knowledge are once again directed by scholars. 'You are too kind to scholars,' said Dr. C., 'they are selfish and impatient brutes'. Then we must work with them, and if possible keep a little ahead of them, and so ensure that their needs are met in a well-coordinated, fair, economical and acceptable way.

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Conference Session III (Tuesday, October 2; 13:30-16:00)

Preservation: National Responsibilities and International Solutions

Chair: Herman Liebaers

Discussant: David H. Stam

- John Jolliffe, "International Cooperation in Preservation" (#9)
- William Welsh, "International Cooperation in the Preservation of Library Materials" (#10)
- Marcus McCorison, "Research Libraries Group Preservation Activities"

NO FORMAL PAPER PREPARED

Conference Session IV (Wednesday, October 3; 09:00-12:00)

Library Technology and Scholarly Behavior: Problems of the Present and Visions of the Future

Chair: David C. Weber

Discussant: Richard DeGennaro

- Patricia Battin, "The Electronic Library" (#12)
- Brenda Moon, "Cooperative Networks and Service to the Scholar" (#13)

Conclusion

- Remarks by Hendrik Edelman and Richard W. McCoy; discussion of plans for publication, further studies and/or future meetings

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